



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

GENERAL LIBRARY  
OF  
UNIVERSITY OF MICHIGAN

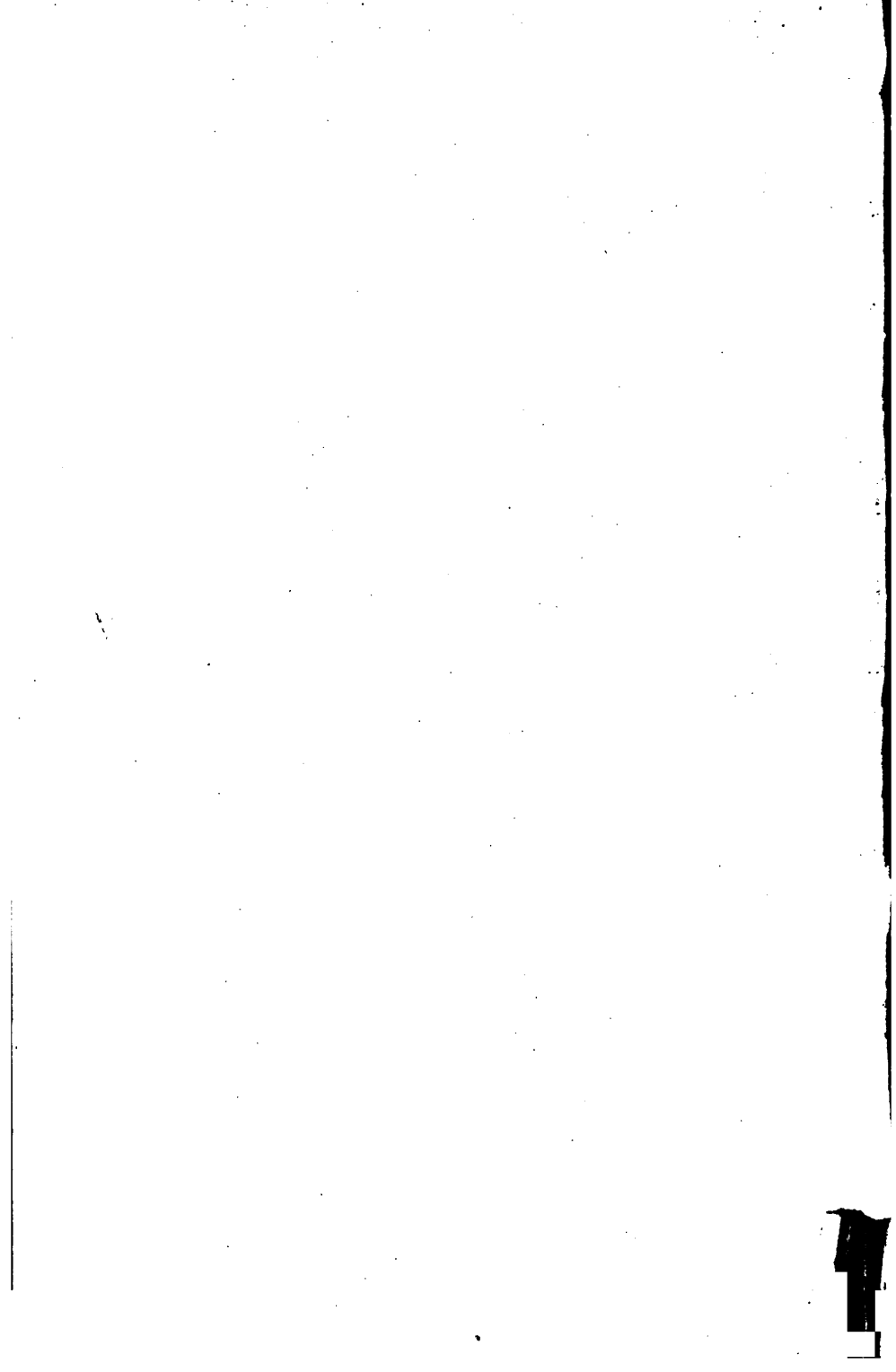
PRESENTED BY

D. S. P. Wilson

March

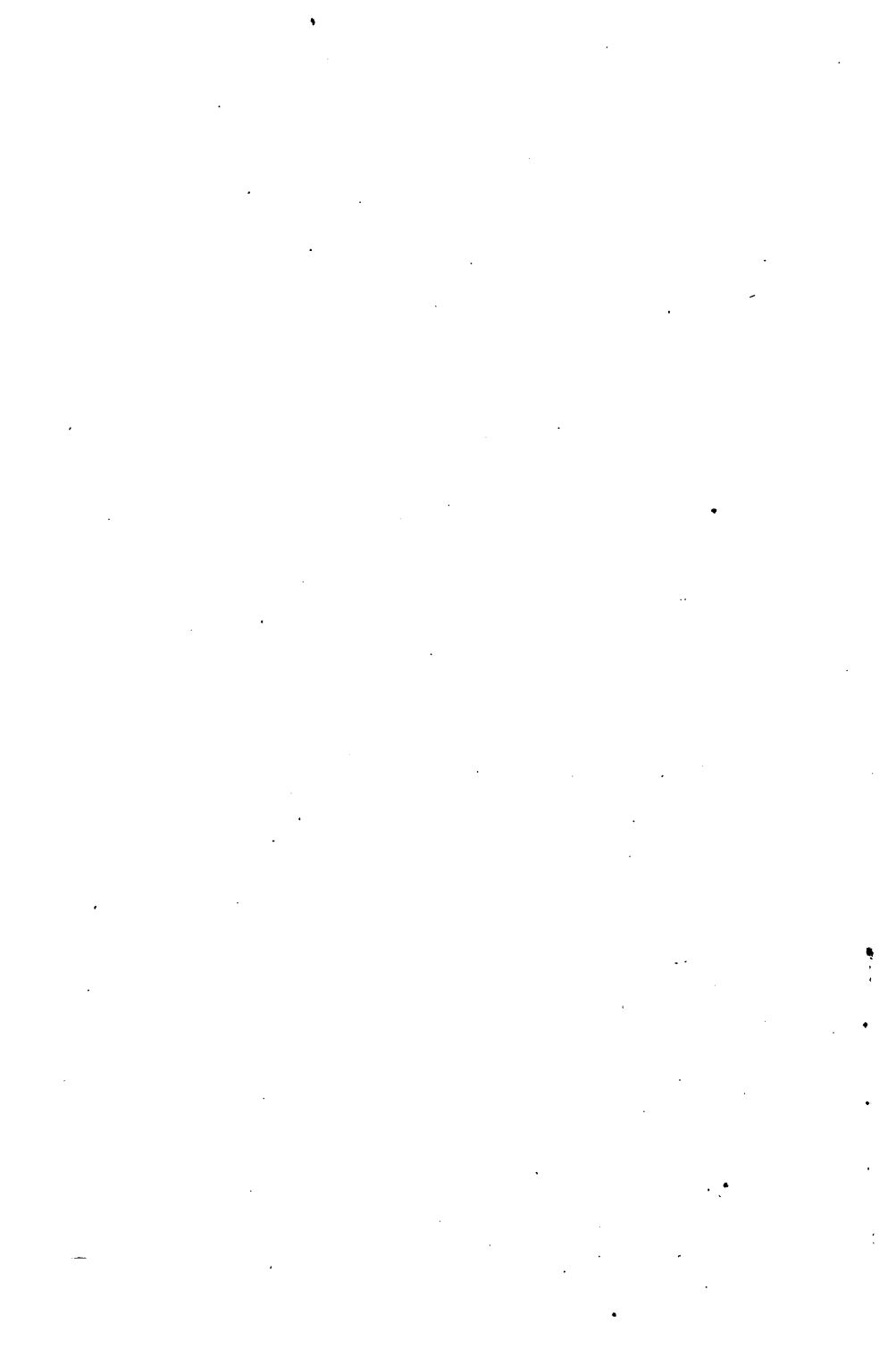
190 0





H 616.7

F 83



THE  
HOMŒOPATHIC TREATMENT  
— OF — 91903.  
Spinal Curvatures  
ACCORDING TO  
THE NEW PRINCIPLE

— BY —

E. C. FRANKLIN, M. D.,

PROFESSOR OF SURGERY IN THE HOMŒOPATHIC MEDICAL COLLEGE OF MISSOURI—AUTHOR OF "THE SCIENCE AND ART OF SURGERY"—SURGEON TO THE GOOD SAMARITAN HOSPITAL, AND EX. BRIGADE SURGEON OF U. S. VOLS.—LATE PRESIDENT OF THE AMERICAN INSTITUTE OF HOMŒOPATHY—EX. PRESIDENT OF THE WESTERN ACADEMY OF HOMŒOPATHY—HONORARY MEMBER OF THE HOMŒOPATHIC SOCIETIES OF THE STATES OF NEW YORK, IOWA, MASSACHUSETTS, TENNESSEE AND KANSAS—FELLOW OF THE SAINT LOUIS HOMŒOPATHIC COLLEGE CLUB — MEMBER OF THE SAINT LOUIS HOMŒOPATHIC MEDICAL SOCIETY, ETC., ETC.

*One Grand Scheme well learned  
Is better than many half studied.*

FIRST EDITION.

ST. LOUIS, MO.

H. C. G. LUYTIES, 306 NORTH FIFTH STREET.  
1878.

Entered, according to act of Congress, in the year 1878, by

E. C. FRANKLIN, M. D.,

In the office of the Clerk of the District Court of the United States,  
in and for the Eastern District of Missouri.



# DEDICATION.

TO MY FRIEND

*DAVID S. SMITH, M. D.,*

OF CHICAGO, ILLINOIS,

ONE OF THE VERY EARLIEST PIONEERS OF HOMOEOPATHY  
IN THE WEST,

AND TO THE

ALUMNI AND STUDENTS OF THE HOMOEOPATHIC  
MEDICAL COLLEGE OF MISSOURI,

THIS TREATISE IS DEDICATED,

AS A MARK OF ESTEEM AND CONSIDERATION FOR MY FRIEND,

AND AN ACKNOWLEDGEMENT

OF THE

ATTENTION AND RESPECT SHOWN ME

BY THE

STUDENTS OF THE INSTITUTION

DURING

NINETEEN YEARS OF COLLEGIATE INSTRUCTION.

BY THE AUTHOR.

JANUARY 1st, 1878.

## PREFACE.

---

*The following monograph was read at the "Western Academy of Homœopathy" by the Author, as Chairman of the Bureau of Surgery, during its last Session in Indianapolis, 1877. Since then, it has been considerably enlarged and illustrated for the use of Practitioners and Students of Medicine. A subject of such great importance and interest, as the rectification of Spinal deformities, and one so little understood by the great Mass of Medical Men, induced me, years ago, to investigate the principles of treatment demanded for restitution of these deformities, and to apply those curative agents required to effect more hopeful results than has heretofore attended the labors of the profession in this direction.*

*The intention of the Author has been, therefore, to present the more prominent and salient features of the disease, and the curative means demanded for their rectification, rather than a learned and elaborate treatise covering this subject; and in its preparation, he has placed under contribution the late and valuable works published on this important and interesting specialty, and is indebted to them for much interesting and valuable material.*

# SPINAL DEFORMITIES.

---

## VARIETIES OF SPINAL DEFORMITY — LATERAL CURVATURE — ANTERO-POSTERIOR CURVATURE OR POTT'S DISEASE.

---

*Definition. — Anatomy of the Spine. — Etiology. Pathology. — Symptoms. — Method of Diagnosis. — Examination of the Spine. — Treatment. — Mechanical Appliances. — Constitutional Treatment, Etc., Etc.*

---

**DEFINITION.** Abnormal curvature or distortion of the spine has largely engrossed both professional and public attention, since Mr. Pott first described the nature of this disease, and the method of its treatment. From the earliest piece of mechanism devised by Pare, for the relief of a diseased spine, of which I have any knowledge, to the recent comprehensive treatise on this subject by Prof. Lewis A. Sayre of New York, this department of the chirurgic art has enlisted the keenest appreciation of the medical profession. To substitute an artificial leg for the natural one,

is a feeble method of restoring this important organ of locomotion, but it is the best means in our power to make good a defect, which would otherwise leave the individual a helpless cripple, a burden to himself, his friends, and the community. The retention of a hernial tumor by an ingenious mechanism saves a ruptured person from the dire alternative of incarceration or strangulation, meanwhile affording him the opportunity of usefulness to his family, and the accomplishment of good in the social and business spheres of life. These are achievements worthy the high and responsible calling of the surgeon.

Deformity of the spine, which unfits the person for the ordinary avocations of life, is not only a constant source of physical and mental suffering, embittering existence and depriving the individual of the enjoyments of life and fellowship with his fellow man, but it is a disability that demands the highest consideration of our art to rectify, and the most persistent efforts for its cure.

Lord Bacon says, "that whosoever has anything fixed in his person that doth induce contempt, has also a perpetual spur in himself to rescue and deliver himself from scorn; therefore all deformed persons are exceedingly bold." Byron in his "Deformed transformed" writes of the daring of de-

formity and its continual effort to make itself equal to the rest of mankind.

“There is a spur in its halt movements to become All, that the others cannot, in such things As still are free to both, to compensate For slip-dame Nature’s ‘avarice at first.’”

Again :

“And shall I live on, a burden to the earth, myself, and shame unto what brought me into life?”

Deformity as a rule is a continual source of unhappiness and discomfort, and if the individual is not educated under proper and controlling influences, the misshapen human being is exceedingly prone to attain maturity as degenerated and ill-fashioned morally, as he is deformed physically.

To relieve deformities, therefore, is not only to rectify and beautify the person, but to promote the welfare of the community to a very appreciable and important extent. So great has been the march of improvement in the adaptability of means to the end in view, and so great has been the advance of science in this direction within the last decade, that I believe the time is not far distant, when deformity will be a rare disorder among civilized nations.

In the present epoch, the relief of deformity has assumed a *specialty*, and like all of its kin-

dred medical and surgical departments, when made the subject of special consideration, has advanced with more rapid strides than ever before. Like *Ophthalmology*, *Dentistry*, *Gynaecology*, and other special branches of the healing art, *Orthopraxy*, to become of paramount benefit to the human race, and co-equal with the others, must of necessity assume the character of a specialty.

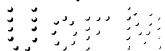
Of all the varieties of deformity, none so greatly detracts from the beauty of the "human form divine", as distortions of the spine, and it is chiefly on this account, that it has acquired such great prominence among this class of disorders. "No lengthened argument," says a distinguished author, "is needed, to show the pre-eminence of a symmetrical trunk in the conditions of human beauty; one illustration will be sufficient to prove this position." In the great museums of ancient art there are treasured *torsos* over which the sculptor and artist dwell with inexhaustable rapture. Limbless, headless, these sculptured trunks are big with an indefinable grace and beauty which set at naught the ravages of time.

"The imagination, as the eye rests upon the genius-wrought marble, readily supplies the wanting parts, and an inspirated whole, rather than a mutilated fragment, occupies the mind. Not such, however, is the effect produced by a sculp-

tured head or limb. Both may enlist our admiration for their independent beauty, but neither the one nor the other enables us to build up in the imagination, that exquisite carriage which is the distinguishing beauty of the human frame. This carriage is mainly due to the trunk; and the relation of the head and limbs to it, apart from the trunk, is slight."

While we admire the broad shoulders, and tapering waists of our City Belles, and descant in rapturous eloquence and poetic expressions upon the curved lines of beauty that outline the female form, which fashion, that potent spell, has constrained with ribs of steel, and corsets of bone, our duty as philanthropic surgeons is to depict to those foolish mothers the blighted form, that "while they count," says Pare, "to have their young daughters' bodies so small in the middle as may be possible, they are plucking and drawing their bones awry and making them illshapen and crooked." Is it not a little singular, that the earliest piece of mechanism intended to be worn for the *relief of a distorted spine*, has been more fruitful of deformity in woman, than any other individual cause?

The same may be said of high heel shoes, and the extravagant extent to which they were carried in that late preposterous fashion, "the Grecian



Bend", which must have resulted in many spinal deformities, had it not been succeeded by a fashion almost the very antithesis of the former, the evil effects of "the Bend" having been antagonized by a new set of muscles called into play, which overcame the injurious consequences of the "latter" by the law of compensation.

The spine is to the osseous what the heart is to the circulatory, and the brain to nervous system. It is a general center for the whole of the bony structures, all of which are developed in harmonious relation to it. According to the observations of our most learned anatomists, "a constituent segment of the spinal column, — the individual vertebra — is the archetype of the entire vertebrate skeleton." The cranium and the upper extremities, and the pelvis and lower extremities, are, it is alleged, only modified vertebrae.

**ANATOMY.** The spinal column is a hollow bony cylinder, composed of separate vertebrae which sustain the entire skeleton, and form the principal lever of the body, and are respectively designated as the *cervical*, *dorsal* and *lambar* regions. The height of this column varies according to the age of the individual, but does not attain its maximum length until the twenty-fifth year.





It is a flexuous column, formed of a series of bones called *vertebrae*. These vertebrae are thirty-three in number, and have received the names : *cervical, dorsal, lumbar, sacral* and *coccygeal*, according to the position which they occupy ; seven are found in the cervical region, twelve in the dorsal, five in the lumbar, five in the sacral, and four in the coccygeal.

The vertebrae in the three uppermost regions of the spine are separate segments throughout the whole of life ; but those found in the sacral and coccygeal regions are, in the adult, firmly united, so as to form two bones — five entering into the formation of the upper bone or sacrum, and four into the terminal bone of the spine or coccyx.

Each vertebra consists of an anterior solid segment or body, and a posterior segment or arch. The arch is formed of two pedicles and two laminae, which support seven processes, viz. : four articular, two transverse, and one spinous process.

The bodies are piled one upon the other, forming a strong pillar for the support of the cranium and trunk ; the arches form behind these a hollow cylinder for the protection of the spinal cord.

The different segments are connected together by means of the articular processes, and the trans-

verse and spinous processes serve as levers for the attachment of muscles which move the different parts of the spine.

These segments are connected by ligaments, which admit of the same arrangement as the vertebrae. They are divided into five sets, viz. : those connecting the bodies, the laminae, the articular, spinous and transverse processes.

The articulation of the bodies of the vertebrae with each other form a series of amphiarthrodial joints ; whilst those between the articular processes form a series of athrodial joints.

Between the vertebral bodies is the intervertebral substance, lenticular disks of fibro-cartilage, varying in shape, size, and thickness in different parts of the spine, being larger in the lumbar region, and corresponding in shape with the surfaces of the bodies between which they are placed. These disks are spongy and eminently elastic by arrangement: for the decussation of the fibrous layers enables them to yield to pressure, and to resume their original position when the pressure is removed, thus forming elastic cushions, which serve to break the force of concussion, and to dispel shocks which would otherwise be communicated to the brain, when sudden force is applied to the pelvis or feet.



*Fig. 1.*



LATERAL VIEW OF THE SPINAL COLUMN.

In the adult, the height of the spinal column is stationary, but a diminution occurs in old age in consequence of its tendency to incline forwards, thus producing more or less atrophy of the intervertebral tissues, and bodies of the vertebrae. The spine viewed laterally presents four alternate curves.

In the cervical and lumbar regions, it arches anteriorly forwards, and in the Dorsal and Sacral, backwards, thus presenting a convexity in the neck and loins, and a concavity in the back and pelvis, these curves presenting opposite directions as they are viewed anteriorly or posteriorly. [See Fig. 1. Spine.] The cervical, dorsal and lumbar convexities have a mutual dependence upon each other, viz: if the cervical curve is more marked than common, the dorsal and lumbar curves will be found to be more convex. The least modification of one producing a corresponding modification in the others, which is of great importance to remember in the treatment of spinal deformities.

The mechanism of the spinal column is as beautiful as it is wonderful.

Firm in structure, it is exceedingly *light*, *pliant* and *elastic*, a combination of mechanical properties which human ingenuity has in vain at-

tempted to imitate. The numerous bones of which these two irregular pyramids placed base to base are composed, the upper, being of the true vertebrae, and the lower, of the *false*, so called because of their process of development, while giving mobility and lightness, do not yield solidity. The soft and yielding intervertebral cartilages act as a series of cushions between the vertebrae, to prevent injury to the soft structures, when the spine is subjected to shock or injury. The alternate inflections permit the greatest variations in the center of gravity, while the canal, that traverses its entire length, not only protects the delicate structures contained within, but increases resistance, without augmenting weight. Held in position by strong elastic ligaments, and surrounded by numerous powerful muscles, its integrity is preserved, and grace and firmness given to its various movements; the force of the muscles being exactly proportionate to the weight they have to overcome. As an organ of support to the head and trunk, *the spine has a solid base of sustentation upon the sacral plane*, where its motions are of the least possible kind.

Mr Adams\* in view of this arrangement has attempted to prove, that the spine is so evenly held in equilibrium by the osseous articulations,

---

\* Lectures on Pathology and treatment of Lateral and other curvatures of the spine.

that the muscles attached to the column are kept in a condition of "vigilant repose", and are ever ready "to start into action when influenced by volition or by the different movements of the body." On the other hand it is contended by more recent authority, that the rectification of the incessantly disturbed equilibrium of the spinal column would be an impossibility were it not for the resistance of the spinal ligaments, and more especially for the action and co-operation of the muscles. The muscles, being in a state of continual active tension, prevent by their compensative function the deformities that are always prone to occur. Whatever may be the antagonistic causes inherent in the muscles themselves, either through "vigilant repose" or "passive vigilance", that are continually on the alert to prevent spinal deformities, one thing is certain, that the treatment under both conditions must still remain the same.

**ETIOLOGY.** In the normal position of the spine, a vertical line drawn from the center of the Foramen magnum to the Sacro-coccygeal articulation will divide the vertebral column and pelvis into two equal parts. While in this condition the weight of the trunk is equally distributed, and the forces acting upon the spine are in a state of perfect equilibrium, as may be proven by the an-

gles corresponding with a line drawn from the ilium and spine on either side.

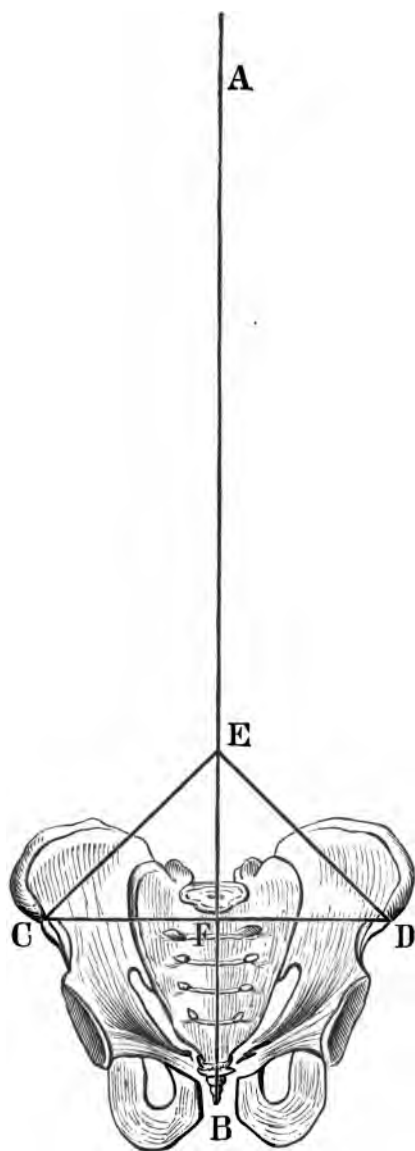
[Fig. 2] Let A-B represent the line drawn from the Foramen magnum or base of the skull to the extremity of the coccyx. C-D, the line drawn from the spine of the Ilium on either side. The angles formed by the lines E-D-F and E-C-F are equal.

When the spine can resume with facility the perpendicular position, shown in *Fig. 2.*, from whatever cause it may have been temporarily deflected, pathologically considered no curvature exists. It follows, therefore, that curvature of the spine only exists when the spinal column is unable to regain its vertical position. Whatever conditions exist to interfere between the healthy and natural equilibrium of the spine, must be considered as the causes of the deformity.

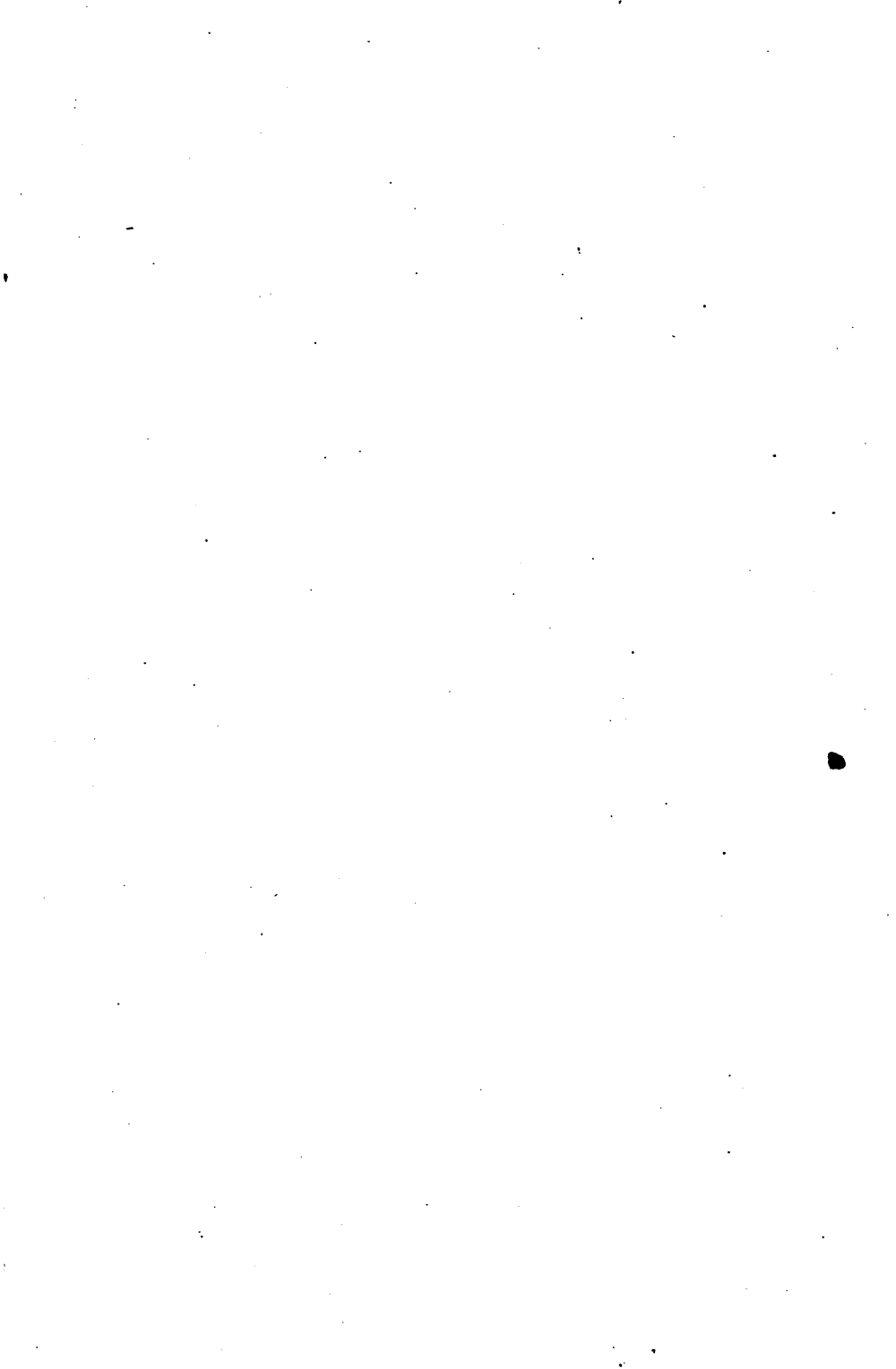
This may be dependent upon diseases of either the vertebrae or the cartilages, or it may be the result of irregular muscular contraction. Whatever the cause of the deformity, the consequence will be a departure of one or more bodies of the vertebrae from the vertical line heretofore given, and in proportion as the head departs from this vertical plane, its line of axis will in like ratio be disturbed. This is demonstrated by reference to *Fig. 3.* The dotted line shows the vertical line of axis, and the dark line, the deflection of the head



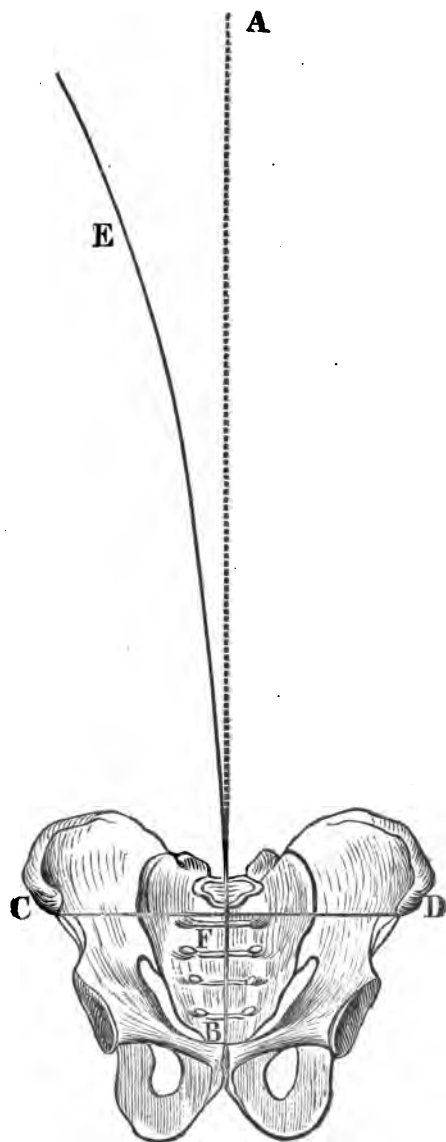
*Fig. 2.*







*Fig. 3.*



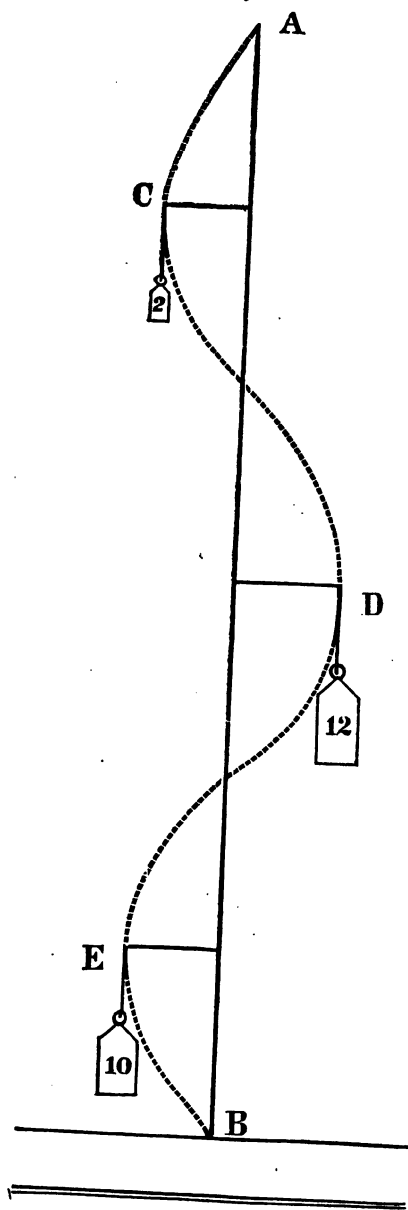
from the base of sustentation, caused by an undue approximation of the bodies of the lumbar vertebrae on their right side.

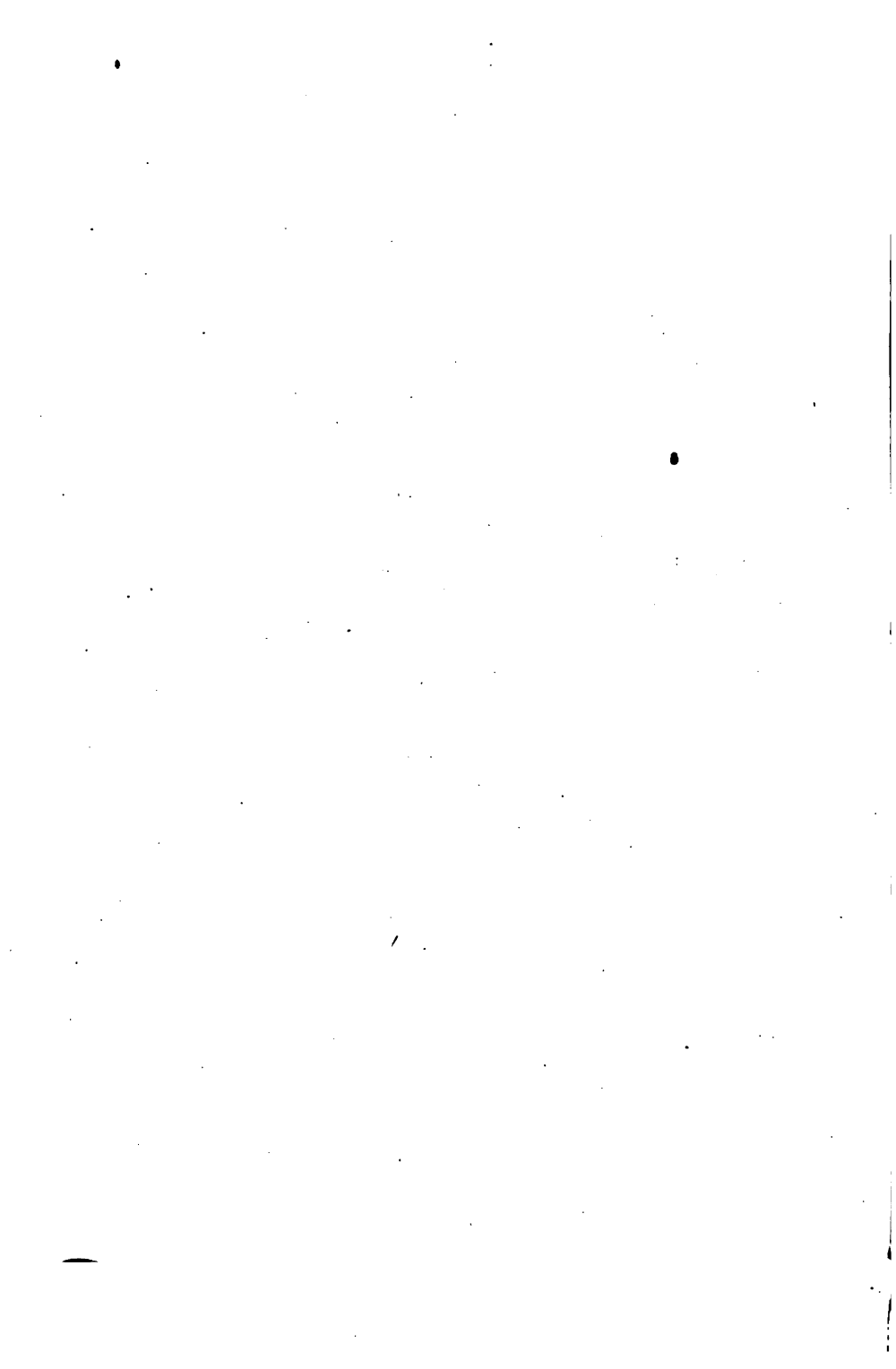
The involuntary effort of the muscles lying on either side of the spine is to restore the head and trunk to their original position, which, if they succeed by their own inherent force independent of artificial assistance, then will the spinal column be restituted, and the deformity will be removed. But if, on the other hand, the disease of the bones or cartilages has resulted in pathological changes, and the deformity can only be restored by the substitution of another force, this force must be applied at the point E, (Fig. 3) above the original vertebral arc, to such an extent as to deflect the spine in the opposite direction, so that the line of axis of the head shall cut the vertical plane through the centre of the sacral vertebrae as shown in Fig. 3, A-B.

It will be observed that in the restitution of the head to its primary position by the forces above mentioned, it is not returned at the expense of the the original curve, but by the formation of other curves as is shown in Figs. 7 and 8, where the arc of curvature is transferred beyond the line of gravity, the equilibrium having been restored by the production of two curves in lieu of one. If, however, the set of muscles lying between the dorsal

concavity and the pelvis act with increased vigor, while the first arc is in the process of formation, the *secondary* curve, which is always called the compensatory, is developed by the set of muscles acting on the opposite side in antagonism to those of the side which keep up the original lumbar curvature. The muscles of the head and cervical region continuing to act, in order to preserve the the head in a state of restitution, produce a third or cervical curve as the only means of preserving the equilibrium between the head, spine and pelvis. The great principle taught by the brief exposition of the genesis of spinal curvatures, is simply this: the impossibility of one arc of curvature existing without the secondary curve of compensation being established, which furnishes the only true basis of successful treatment of spinal curvatures. To illustrate the theory of spinal curvatures, a simple mechanical experiment has been employed, which consists of an upright semi-elastic rod having three transverse arms attached to those portions which more closely correspond with the centres of spinal curvatures, — Fig. 4. If a weight of ten pounds was suspended at *E*, the whole rod would yield and ultimately fall to the left side; but, if twelve pounds be placed at *D*, then the rod would yield to the right side, and the only means by which it could preserve its equilibrium would be to place two pounds at *C*.

*Fig. 4.*







The spinal column is held in position by antagonistic sets of muscles, the contractions of one set exactly balancing those of the opposite side.

When the muscles act in harmony — the different groups being properly set off by their respective antagonists — then the spinal column, whether at rest or in motion, is always where it should be. But if the action of certain muscles is not properly antagonized, then this harmony or co-ordination is lost, and the spine makes a greater flexion *toward* the point where is the stronger muscular action, if this action is in the transverse direction, as of the scapular muscles acting at the *middle* of the spinal column; but *from* the stronger muscular force when acting from one side at the *ends* of the flexible column longitudinally. That is, the spinal muscles act like a string to a bow; and if they contract more on one side, the ends of the spine are made to approximate toward that side, making the spine to swell out toward the other side; but the scapular muscles, acting at the middle, would draw the spine toward themselves: and thus this unequal muscular action causes the spine to deviate to the right or left, *to* or *from* the stronger muscles, according as they may happen to be those that act longitudinally or transversely. If through any cause either set assumes an attitude of increased vigor, the corresponding ones yield

and then a curvature is produced, its concavity looking towards the side upon which the stronger set of muscles is situated. It is obvious, that a considerable weight can be sustained on the apex of a perpendicular column without effecting lateral deflection ; but, change the axis of the base, upon which the column rests, ever so little, and a disturbance of equilibrium takes place, the weight no longer seeking its equilibrium in the direction of the least resistance. If the weight was left to itself, it would gravitate to the base of sustentation, but, if the shaft be composed of elastic material and possesses sufficient flexibility to yield in any direction, then equilibrium can only be regained by the formation of a curve or curves, until the weight falls over the line of gravity, as has been illustrated in figure 4. The *compensatory* curves are the result of abnormal muscular contraction, in their efforts to rectify the evils arising from the primary deflection. Whenever the lumbar curve is first developed, the dorsal becomes the compensatory arc and vice versa.

The importance of ascertaining which of the curves is the *original* one is so *great*, that *the surgeon will not be able to successfully combat the deformity without its knowledge* ; for it is the pathological condition of the *first* curve to which treatment must be directed.

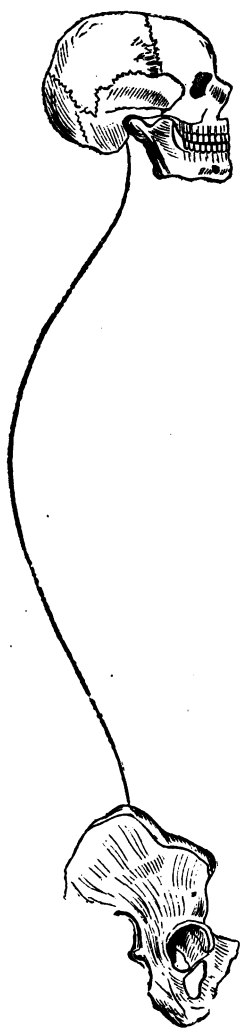
Dr. Sayre, to whom the medical profession is more indebted than to any other modern author for the investigation, pathology and successful treatment of this hitherto formidable and incurable disease, has observed, that curvature of the spine "never occurs in those persons who are compelled to maintain an erect position." "For instance," says he, "those who are accustomed to carry weights upon their heads, such as baskets of clothes or pails of water, do not get lateral curvature of the spine, simply because they are obliged to maintain the body in a perfectly erect posture, and that is done by causing the muscles of the trunk to contract with equal force on both sides." "Half of these deformities," he adds, "are the result of a want of energy, a want of life enough to sit up straight, consequently are most commonly seen among that careless, lifeless class of persons who are in the habit of sitting the greater part of the time, with their backs twisted and bent in a half curved position." Indulgence in such careless habits of sitting, not unfrequently, develops a curve in the spinal column at some point which is sufficient to establish the deformity, and then in a very short time a second curve will be developed, which is compensatory. When these spinal deviations are developing, excepting only in those cases which occur in adult life, the vertebral column undergoes double or quadruple rotation, the di-

rection of the rotation in each instance being determined by the direction of the curvature. In cases where the convexity of the curve looks backward only and is limited to the dorsal region, it is known by the term "*Cyphosis*", Fig 5. When the convexity looks forward, the lumbar and lower dorsal vertebrae being interested, as in Fig. 6, it is called "*Lordosis*"; and "*Double Lateral Curve*", Fig 7, and "*Quadruple Lateral Curve*", Fig 8., or *Scoliosis*, when more than a single curve exists as is represented by the Figures above given.

**PATHOLOGY.** Curvature of the spine occurs as a rule, chiefly in vitiated, anaemic subjects, although instances sometimes occur in which it is difficult to determine the tuberculous, strumous or vitiated origin, especially in those cases where the disease is developed later in life. Its usual period of invasion is in childhood, but it may occur at any period of life; according to most authors the *lateral curvature* is more frequently observed in girls than boys, whereas the *antero-posterior curvature* is seen more frequently among boys, but my experience leads me to the opposite conclusion.

The disease is seen much more frequently in the northern and middle latitudes than in the tropics, and is rarely observed among the barba-

*Fig. 5.*



CYPHOSIS.

*Fig. 6.*

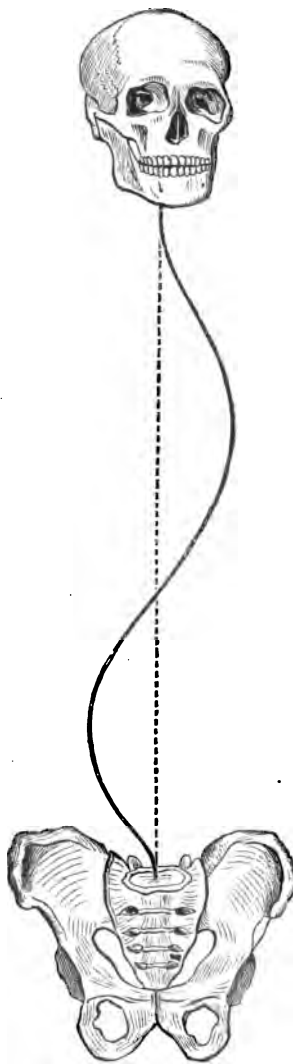


LORDOSIS.



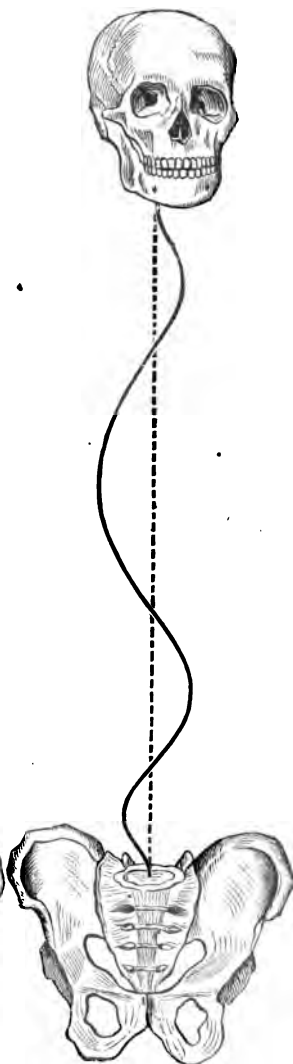


*Fig. 7.*



DOUBLE SCOLIOSIS.

*Fig. 8.*



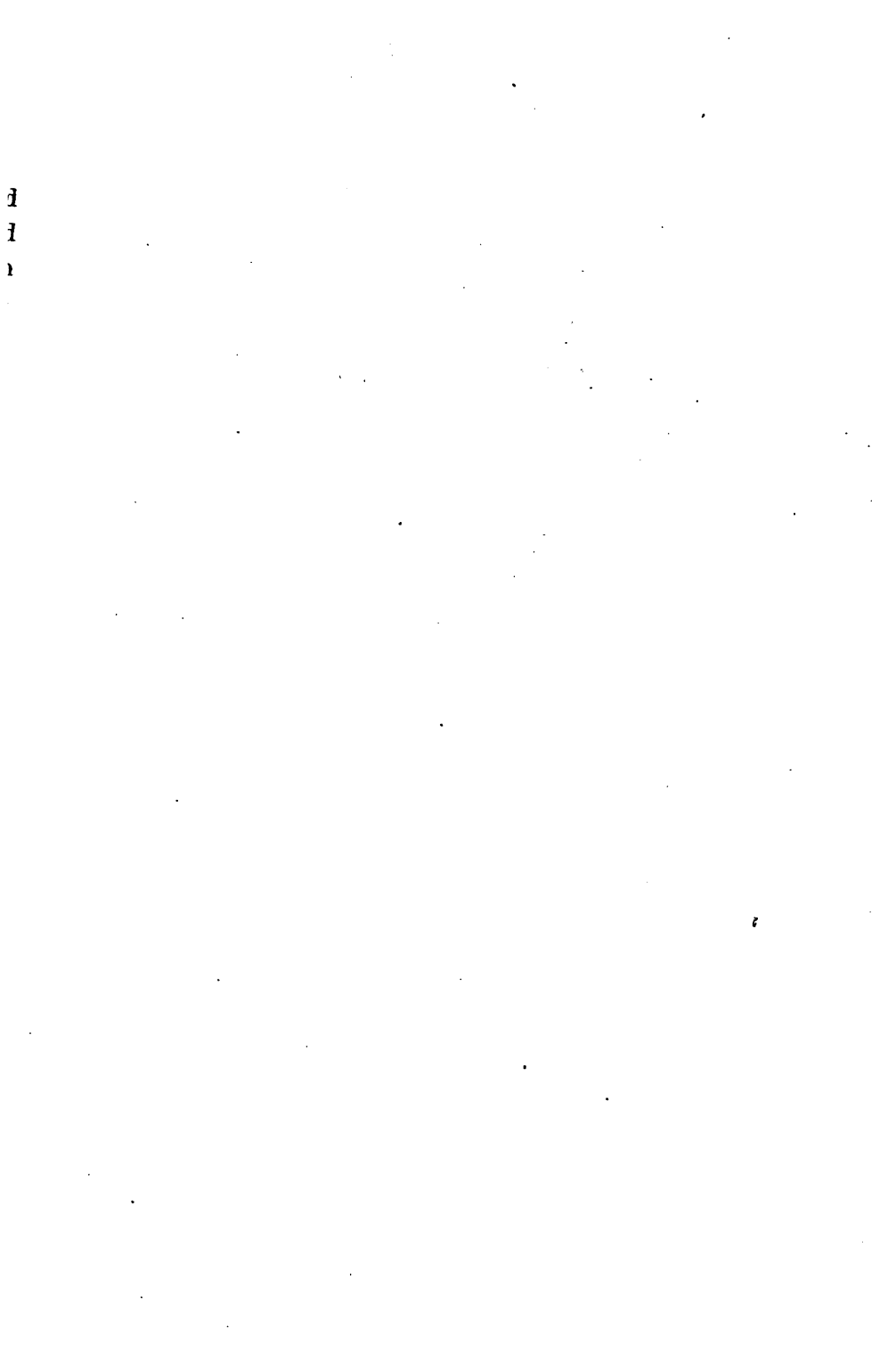
QUADRUPLE SCOLIOSIS.



rous and nomadic races. The children of the humble classes as a rule are its special victims, owing no doubt to the faulty hygienic and dietetic conditions under which such children are usually raised. In the large majority of cases of lateral curvature the primary dorsal curve is to the *right* side, and is owing no doubt to the greater strength and tonicity of the muscular system of that side, with a preternatural flexibility or diminished elasticity of the inter-vertebrate fibro-cartilages. The earliest indication of lateral curvature, in the female especially, is observed in the *increased projection of one of the scapulae*, and in most cases the dressmaker is the first to call attention to the deformity (Fig. 9, Lat. Curv.). Upon careful examination, even at this early period, it will be observed, that when the patient stands erect with the heels together, the middle dorsal portion of the spinal column is slightly curved to the right, and there is also a corresponding deflection of the lumbar and lower dorsal vertebrae to the left. The left shoulder at the same time is somewhat lower than the right; the left hip droops in a corresponding ratio, and projects posteriorly (Fig 10.). At a later period when the curvature is increased to a more appreciable extent, the weight of the head and trunk no longer rests over the centre of gravity, but corresponds with the dark line E., as is shown in Fig 3. While this is going on, especially among children

of tender years, the spinal column is steadily and progressively undergoing change in position and contour, and a double or quadruple rotation, in each section of the column is gradually being developed, the rotation being determined by the extent of curvation. In all cases the spinous processes are turned more or less in the direction of the convexity, so that in double lateral curvatures, the dorsal curve being to the right, as happens in most cases, the spinal processes of the same vertebrae incline to the *right*, while the bodies of the lumbar vertebrae are inclined to the left.

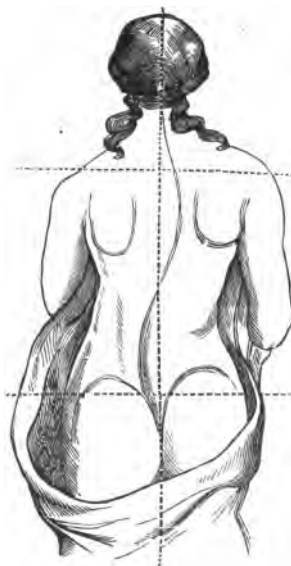
When a curve becomes established by the undue action of any muscle or muscles attached to the spine, its increase is gradual and persistent in consequence of the progressive ataxia of the opposing muscles. As all anatomists are aware, the great serrati muscles are the chief external inspiratory muscles in the body, and by their attachments to the vertebrae and ribs, the shoulders being fixed, elevate the ribs and increase the capacity of the chest. The rhomboidei muscles arising by attachments from the four upper dorsal and last cervical vertebrae, and inserted into the posterior border of the scapula, attaches this bone firmly to the spinal column, thus practically making the shoulder a fixed point. With this muscular arrangement, and with the assistance of



*Fig. 9.*



*Fig. 10.*



LATERAL CURVATURE.

the latissimus dorsi and trapezius, the serratus magnus of the incurvated side, acting as a lever upon the ribs, rotates the spine upon itself, producing the so-called *rotary-lateral curvature*. It has been remarked by recent authority, that in the dorsal curvature the bodies of the vertebrae are always twisted to the right, while in the lumbar curve they are turned to the left.

Any cause, therefore, that approximates one scapula nearer to the spine than the other, acts as a stimulus to produce lateral curvature, and once being established the tendency is, progressive deformity.

The success attending treatment in all cases of rotary-lateral curvature of the spine depends upon the age of the patient, and the freedom from fixation of the involved bones and ligaments. It is consequently of the greatest consideration that the diagnosis in these cases be made out *early*, and the treatment begun while the disease is in its earliest development. When a curve once becomes established by the action of the Serratus muscle of either side, it gradually increases in progressive ratio as the opposite muscle loses its contractile power. To such an extent has this been carried that the angles of the ribs upon the side of the curve have become flattened, while the opposite ones assume a correspondingly sharp and angular

expression. It is this encroachment and pressure upon the lung structure that gives rise to the short breathing, pain and oppression that afflict those who suffer from this variety of deformity. Any cause, therefore, which produces undue muscular contractility of the serratus of one side to a greater extent than that of the opposite side, favors the production of distortion, and the deformity once begun increases *pari passu* with the increasing muscular effort, and develops persistently, no opposing forces being employed.

I have frequently been asked, by inquiring patients with slightly developed lateral curvature, if it will "get worse without treatment", and my answer always is affirmatively, if nothing is done to prevent or rectify the deformity.

The causes of spinal curvature may be summed up as follows :

1. Muscular contractions.
2. Frequent spinal curvations in the same direction.
3. Loss of equilibrium between spinal resistance and superincumbent weight.
4. Disintegration of vertebrae by softening or caries.

**SYMPTOMS.** One of the early symptoms of lateral curvature is an undue prominence of one of the scapulae. Whenever this condition is presented, the whole length of the column should be examined in the following manner: Have the patient entirely denuded of his clothing, and stand him up, his back toward you and leaning well forward; now firmly press your finger slowly along the whole length of the vertebral column, beginning at the uppermost cervical vertebra, and continuing downward to the extremity of the sacrum. The pressure produces an excitement of the skin along the whole length of the spine, presenting a *reddish* line. Or, as may be necessary in doubtful cases, touch the extremity of each spinous process with a pencil dipped in black ink, the appearance of the inked line will demonstrate the existence of curvature, if any exist. The existence of a curvature, even in its earlier stages may usually be detected by placing your hands in the axillae, and lifting the patient forcibly upwards. The weight of the head and shoulders will be removed from the spinal column, the curvature entirely disappearing, to be renewed again as soon as the force is withdrawn. Or, if the patient be extended upon a table face downward, the spine if not assuming an almost straight line, can be made to do so by a slight extensive force.

As soon as deformity is detected, treatment should be commenced, for if it be permitted to increase, the muscular contractions, assisted by the superincumbent weight of the head and shoulders, will draw the spine more and more towards the arc of curvature already begun, thereby continually and progressively increasing the deformity. If the deformity begins in the sacral region, the compensatory curve in the dorsal will soon become established, and vice versa.

**TREATMENT.** So soon as it has been established that curvature has taken place, the surgeon should adopt the underlying principle of treatment in all deformities, which is, — “to put those muscles upon the stretch which have lost to a certain degree their contractility by inaction or repose, and to approximate the origin and insertion of the muscles you wish to keep in a state of quiescence.” This can be effected only by force applied in a direction contrary to the muscular power previously in action. A variety of mechanical contrivances have been devised by the ingenuity of surgeons for the relief of these deformities.

The serrati muscles being the chief muscular agents to be considered in this reduction, it is a principle, that the *muscle* on the side corresponding with the dorsal curve be placed in such a po-



sition that its fibres will be at *rest*. This can be effected by carrying the corresponding arm across the chest, the hand resting upon the opposite shoulder. The muscle upon the opposite side should be made as tense as possible, which can be done by carrying the arm backwards, and letting the back part of the hand lie upon the posterior crest of the opposite ilium. This muscular force *continuing to act*, draws the scapula backward, and contracting upon the curvature, rotates the bodies of the vertebrae towards their normal position. Patients should be instructed to maintain this position as much as possible, and at the same time habituate themselves to take frequent deep inspirations. The lung of the relaxed side, by this movement, is effected little or none by the full inspiration on account of the fixedness of the scapula; but, the contractility of the opposite muscle lifts up the angles of the ribs of that side during the lung exhaustion, and draws them back to their natural position, thus gradually unfolding the deformity. Another important aid to effect this end is to cause the patient to sit upon an inclined plane, the lower side of which corresponds to the depressed shoulder, which is placed at such an angle as will necessitate a constant muscular effort to keep from falling off. This inclined plane can be attached to an "ordinary chair," or other seat as the ingenuity of the surgeon may suggest.

"In the earlier stages," says Sayre, "the benefit derived simply from sitting upon such a stool for a certain number of hours daily is sufficient to overcome the deformity; but the position should not be indulged in to such an extent as to produce fatigue." Both of these principles of treatment may be assisted by attaching elastic bands, to the wall on that side of the patient corresponding with the arc of curvature, and to the ceiling above the shoulder on the opposite side, of such length that they can be just touched, with handles attached to their free extremities, and directing the patient to pull upon them, while holding either of these positions, and at the same time breathing deeply and expiring gradually. The elastic horizontal band should be of sufficient firmness to give support to the arm while in exercise. "These simple adjuvants to the general treatment," says Sayre, "are worth more than all the appliances I have ever seen devised for the correction of this deformity in its earliest stages, i. e., before the bones have become changed in form."

A variety of mechanical contrivances have been employed by different surgeons to remedy these deformities, the chief and best of which are, the apparatus of Mr. Barwell, of London, the spiral corset of Sayre, and the belt of Davis. These and many others are applied to effect the

same result, but the varieties above given are superior in my judgment to all other appliances now in use, except the *plaster jacket* and my *artificial spine*, which supercedes them all, and can be effectively applied to any kind of spinal curvature.

The recent principle adopted by Prof. Sayre, of treating these cases with the suspensory apparatus, and the subsequent application of the "plaster jacket," with the aid of the artificial spine, has proved in my hands incomparably the best, and at the same time the most scientific method of meeting the indications for treatment in this class of diseases; and I have no hesitation in affirming, that this mode of treatment with such improvements as may be suggested by the surgeon from time to time, to meet special indications or conditions, will supercede all other mechanical appliances, at present known for spinal curvatures. I am successfully employing a modification or rather improvement of Sayre's "plaster of Paris jacket," which in my hands has produced better results than those of any like apparatus. One of the principle improvements in my application of the "jacket" is a fixation of an artificial sacrum or plane upon which the superstructure is built. A number of cases have been, and many others are still under treatment,

which promise results much more satisfactory than the use of the original plaster of Paris jacket, as applied by Prof. Sayre.

Upon my improved plaster jacket, as represented in Fig. 13, is fitted the artificial spine, which is so arranged that the whole weight of the head and shoulders is suspended from the base as a fixed plane, the elastic forces connecting the mento-occipital apparatus to the steel cross-bar corresponding to the natural elasticity of the intervertebral cartilages. By the persistent and unceasing action of these *semi-elastic* forces, the vertebral curves are more quickly overcome, and a restoration of natural equilibrium more surely established.

The artificial spine, when properly applied, gives an uplifting weight to the head, back and shoulders, its base resting upon the sacral plane. The little patients who have worn this improved foundation jacket, say it is "very comfortable," and they feel better while wearing it than when I employed the "jackets" and "Jury masts" of Prof. Sayre.

In a few cases, where the plaster jacket was opposed, through undue sensitiveness, I have applied a *closely fitting duck corset*, having pieces of whalebone quilted along its external surface, and adapted to the contour of the body. Upon

the posterior portion, and on either side of the spinous processes, are firmly riveted to the corset, plates of iron, three-fourths of an inch wide, and one-eighth thick, extending down the back, the length varying according to the size of the patient. These plates are held together at the upper and lower extremities by cross pieces of equal width and thickness, forming a framework upon which is attached the upper or head piece of the artificial spine. This corset is applied by lacing it firmly together, as in the ordinary corset, the patient being *suspended* during its application.

In young children, I have found these advantages in its use, viz.: it can be removed nightly, and applied again on first rising from the bed; the body can be bathed every morning, and friction and medical applications be employed to the spine, to strengthen and develop the relaxed muscles. The objection to the general use of this improved spinal corset is the expense in its preparation. In cases in which it has been employed, very satisfactory results have followed its use.

The measurements for the corset should be taken while the patient is suspended. In its manufacture, the waist is the central point in the adjustment of the whalebones, and should be made firmer and stronger than the other parts, the slope of the corset above and below corresponding with

the double conical shape of the body; it should extend to the axillae of either side, and rise front and rear in a semi-circular shape, while the bottom line extends downwards well over the nates and ilia behind, and gradually rises upwards in front as it ascends over the abdomen. This base line of sustentation forms the sacral plane for the artificial spine, and should be thicker than the corresponding portion.

The spiral corset of Sayre is advantageous in this, that it rectifies the trunk to a considerable degree, but does not lift off the diseased spine the superincumbent weight of the head and shoulders, and, so far, it is palliative only, not curative. If the same apparatus that I have applied to my duck corset, could be made serviceable in the spiral, it would greatly facilitate its usefulness, but I do not think any of these appliances will ever supercede the principles involved in the application of the "plaster jacket."

# ANTERO - POSTERIOR CURVATURE,

OR

## POTT'S DISEASE — TUBERCULOSIS OF THE SPINE, ETC.

**ETIOLOGY.** In a large variety of cases of this disease, its history and progress furnish sufficient evidence upon which to base a correct diagnosis. As a rule it occurs in delicate, scrofulous children, is developed early in life, and, in a large proportion of cases, is met with before the sixth year.



(Fig. 11.)

Its origin has been attributed to injuries received even weeks or months before the appearance of the disease, but I do not believe, that these causes will produce the disorder independent of tuberculous predisposition or constitutional impairment. In most cases, antero-posterior curvature (Fig. 11, Pott's disease) is first deve-

loped in the inter-articular fibro-cartilages; in others, the primary lesion is said to exist as a tuberculous deposit in the cancellous structure of the bodies of the vertebrae. In either case there is a gradual absorption and disintegration of structure, until at length the affected vertebra is reduced to a mere shell, with perforated and crumbling walls, and it is crushed beneath the weight of the superincumbent column. As a result of the inflammatory process, caries takes place, and abscesses as a consequence develop sooner or later. It has been observed, that in rare cases patients have recovered without any evidences of the existence of matter; and, autopsies have demonstrated the fact, that a large portion of the vertebrae have been destroyed, without having detected the existence of pus. *Functional* disturbance may exist in the ossific or soft structures, for a considerable length of time, before the attention of the surgeon is called to the real condition of the disease, and in some cases the bones have been partially destroyed and distortion decidedly marked, before a correct diagnosis is formed. In all cases of spinal irritation or injury done to the spinal column, it is the duty of the surgeon to make a careful and critical examination, so as to detect the disease before any great inroad has been made in the spine, or the patient's health. When the disease has progressed to such an extent, that inflam-



matory softening and disintegration of the osseous tissue exist, the weight of the superincumbent body pressing upon the inflamed and degenerated tissues, will produce absorption, which affects more the anterior portions of the vertebral bodies than the posterior. This force still continuing to act, absorbs more and more of the bony wall of the spine, the contiguous bodies fall together, which gives to the spinous processes the prominent and angular appearance in such cases.

ARTHRO-CHONDRITIS. By this term is designated the inflammation of the vertebral and intervertebral structures, accompanied with caries, softening and ulceration of the intermediate fibro cartilaginous tissues, terminating in abscess. In the older works on surgery they were known as "psoas" or lumbar abscesses. This disease occurs more frequently during early childhood, but is occasionally met with later in life. It is peculiar to the scrofulous or tuberculous diathesis, and is produced or aroused into activity by some direct injury. These abscesses may occur at any part of the spinal column, but the liability to them diminishes as we leave the lumbar vertebrae to mount upwards. They are preceded by the usual signs of inflammatory action, local pain, tenderness, and angular projection of the spinous processes, accompanied with those general disturb-

ances, such as chilly sensations, throbbing in the part, fever, and formation of pus, and final termination in abscess and fistulous openings.

When this disease invades the cervical vertebrae, terminating in the condition above mentioned, the pus usually presses towards the back of the pharynx, forming a *postpharyngeal abscess*, or, dissecting its march downwards between the oesophagus and vertebrae, it finally enters the posterior-mediastinal space. Pus resulting from degeneration of the lower cervical and dorsal vertebrae generally takes the same direction, following along the posterior mediastinal space, passing under the ligamentum arcuatum internum until it gets within the sheath of the psoas muscle, and finally makes the same exit as the psoas abscess. I have a little patient at the present time six years of age, who is under treatment for spinal curvature, where these vertebral abscesses open upon the back, on the right side, about  $2\frac{1}{2}$  inches from the spinal processes, between the trapezius and latissimus dorsi muscles. She has been "put up" once in my artificial spine and plaster jacket, which relieved to a decided extent all the spinal troubles, the quantity of pus decreasing from day to day, and her general symptoms gradually improving under the use of calcaria phosph., silicea, and mercurius.

Cervical and dorsal abscesses may open into the cavity of the thorax with all the serious results of that condition. Pyothorax may also point in the same direction.

The psoae muscles have their origin from the sides of the bodies of the last dorsal and four upper lumbar vertebrae, and when caries affects either of these vertebrae, the pus burrows along the muscular fibres within the sheath, causing at times atrophy or destruction of the muscular tissue, and finally escapes from the abdominal cavity by the same outlets as the psoae abscesses which result from psoriasis.

**SYMPTOMS.** As I have before said, this disease is incident to early life, and it is sometimes observed before the child begins to walk, the first indication being in these cases a slight projection of one of the spinous processes, either of the dorsal or upper lumbar vertebrae. In a critical examination there will be detected a slight lateral curvature, or a certain degree of fullness involving two or more spinous prominences, preceding the more acute angular projection. In an older child, and after he has learned to walk, it will be noticed that he trips easily and falls; that his feet will rather drag, and are not properly raised in walking. The toes are turned in slightly, pro-

ducing a shuffling gait; then follows the spinal projection, and the accompanying pains in the legs, side, back or abdomen, with spasmodic contractions of the muscles during sleep, *restlessness, fever and fretfulness*.

As the disease progresses, the adjacent vertebrae become involved, with projection of their corresponding spinal processes, forming at the region invaded an abrupt angular prominence. The system now begins to show suffering, the appetite is poor, breathing is difficult, the bowels are constipated, abdomen swollen, and the urine pale and alkalescent. The gait and general appearance of the patient at this stage are characteristic of the disease.

He walks with his head, shoulders and pelvis thrown back, and slides rather than walks, for fear of the pain inflicted by the quick movement of walking.

When standing, he will be found resting his body upon his knees, or leaning against a table. If you ask the little sufferer to pick up a pin or other substance lying on the floor, he will not bend over as ordinarily done, but will get in that position that will serve to lift the weight of the head and shoulders from the spine; this will be effected by squatting down and picking up the object by a sliding motion.

— In the earlier stages of the disease the pressure made by the spinal processes upon the nerves as they make their exit from the whole length of the spinal cord, produces evidences of disturbed function at their distal extremities.

If the disease is situated in the *cervical* region, the patient will complain of choking, difficulty in swallowing, unpleasant sensation about the larynx, pain in the thorax, and cough, long before actual deformity occurs. In the absence of lung, heart or throat difficulties of sufficient importance to develop these symptoms, it is the duty of the surgeon to make a thorough examination of the spine to ascertain the actual morbid condition of the spinal column.

In disease of the *dorsal* region, the patient will suffer from the effects of injury done to the nerves that supply the contents of the thorax and upper portion of the abdomen.

There will be felt a sense of constriction as of a band encircling the body. The heart will perhaps be functionally disturbed, with furtive pains in the lungs, and pericardial region. The stomach will be disturbed, with flatulence, gastric pains, and more or less evidences of indigestion, with constipation.

The evidences of the disease being situated in the lower dorsal or lumbar region are, irritations about the bladder and rectum, with streaking pains down the thighs, or a frequent desire to void the urine, with contractions of the flexor muscles of the thigh. When such symptoms exist independent of any well recognized disease, always examine the points where the spinal nerves make their exit from the vertebral column, and carefully search for any tender or sore spots in their vicinity.

In the early stages of the disease the muscles are contracted by reflex irritations, which affect to a considerable degree the appearance and action of the child.

Throughout the whole case it will be observed, that all the movements of the child are so directed that the least possible motion shall be given to the spine. "Every joint of the lower extremities," says Sayre, "is bent for the purpose of preventing concussion from affecting the bodies of the vertebrae. The chin is made to project; the shoulders become elevated, and it is impossible for the child to stand upright and receive any concussion whatever which may be communicated to the bodies of the bones without suffering pain. The muscles of the back are held rigid in order to prevent any movements of the bodies of the

vertebrae upon each other." The patient, if young, cries from very slight causes, either mental or physical, has an anxious expression of countenance, and moves the body with that care and caution that indicates pain and sensitiveness; he breathes short, a long breath producing pain. Some patients walk more than naturally erect, sliding the feet upon the floor rather than lifting them; the arms and shoulders are sometimes thrown back to save the muscular effort necessary to keep the body erect, for as the disease advances, difficulty of maintaining the trunk upright increases. Any concussion of the spine, by sitting down suddenly, riding, or walking, causes the child to express painful emotions. At night they will oftentimes cry out with pain, yet are not able to describe its exact location. As a rule the pain will lead the surgeon to the point affected either directly or through nervous reflections.

**EXAMINATION OF SPINE.** After stripping the child and laying him across your lap, face downward, with the arms over one thigh and the legs over the other, then gradually separate your thighs, and you will almost uniformly observe that the child gives a long-drawn sigh of relief, a full inspiration and a complete expiration. So long as the child is held in this position, he will breathe easier and fuller, if the extension is not

carried so far as to produce reflex muscular contraction. By this mechanical process, the nerves supplying the lungs and interior parts of the thorax are relieved of all pressure, and the muscles of all irritation. Now gradually close your thighs, and the muscles will again resume their contractility, the child breathing short and quick as before.

When the extension is removed, there will be more or less spasmodic action in all parts of the body; spasms of the extremities may be developed at pleasure, by placing one hand upon the head and the other over the bottom of the sacrum, and pushing the bodies of the vertebrae together, if the disease be situated in *the anterior part of the vertebral bodies*. If the affection involves the *sides* of the vertebrae at their junction with the ribs, pressure upon the spine may *not* produce pain, and even percussion may fail in eliciting pain, but if pressure is applied so that the heads of the ribs are made to impinge upon the vertebral facets, pain will be immediately experienced, and by separate pressure upon the ribs, the precise point of the disease can be detected.

The absence of pain on pressure over the spinous processes of the vertebrae is regarded by some, that no disease of the bones is present, but, it should be remembered that in affections of the



*anterior* portion of the spine, especially when disintegration takes place, pressure *removes* the contact of the diseased bones, and therefore relieves rather than inflicts pain. In obscure cases, when nothing definite can be learned by manipulation, the application of ice, intense heat, or the electro-magnetic battery to the spine, may be employed.

The ice, or heat moving gently along the spine produces no effect until it comes in contact with the diseased spot, when pain and even a *spasm* will be developed.

By these processes, and that of Dr. Seguin's delicate surface thermometer, which will show an elevation of temperature over the inflamed part, we are enabled to detect spinal disease, when all other manipulations fail. As has been before observed, it is one of the most important considerations to arrive at a correct diagnosis in any variety of incipient spinal disease before deformity appears, as upon an early recognition of the disease depends its most successful and speedy cure. I have under treatment at the present time, a case where cervical curvature was preceded by a dry, hacking cough, which withstood the action of every well directed remedy. The persistence of the cough aroused the fears of the parents, and the child was brought to my office for examination, when I detected incipient cervical disease.

The cough entirely disappeared after the treatment was entered into for spinal curvature. In this case, the persistent and racking cough was the only discernable symptom that called my attention to the real state of the disease.

**PARALYSIS**, *complete* or *partial*, is sometimes the result of spinal tuberculosis, and is dependent upon:

1. *Direct* pressure on the cord by effusion into the spinal canal, or, by encroachment on the cord by a diminished calibre of the bony canal.
2. Pressure on the nerve filaments issuing from it by protruding vertebrae.
3. Hyperæmia, irritation or inflammation, communicated to the membranes, or the cord itself, from the diseased surrounding bones.

The degree of paralysis is by no means dependent upon the amount of deformity. A large curvature may co-exist with but little weakness of the lower limbs, while complete paralysis sometimes occurs when only one vertebra projects from the line of its fellows.

The extent of paralysis varies according to the part of the spine affected, and with the amount of irritation propagated to the cord from the disease of the surrounding bones. Thus, if the pro-

jection takes place in the lumbar region, paralysis of the lower extremities only will probably occur. If the disease is in the dorsal region, and severe, the sphincter muscles run a great chance of sharing in the loss of power. The upper extremities have been occasionally paralysed by extensive disease in the neck; but these are far less liable to be affected than the lower.

Again, the effect of irritation of the anterior columns of the cord will be to diminish or destroy the power of voluntary motion, and less frequently that of sensation; while affections of the posterior columns will cause similar destructive results on the reflex function of the same part.

The majority of those cases of paralysis, resulting from spinal irritation, dependent upon tuberculosis, in which reflex action is undiminished, while voluntary motion, and even sensation, is impaired, is accounted for by the fact, that the bodies of the vertebrae being alone affected by the diseased process, the anterior columns of the cord will be the ones evidently affected, while the posterior, except in rare cases, will remain unharmed. Paralysis from *pressure* is diagnosed by a lax and flabby state of the muscles, that from *irritation* being followed by a tense and rigid condition.

**TREATMENT.** The spinal column being, not a single bone, but a congeries of some twenty-four, jointed together by their bodies and arches, it is obvious that its diseases come under the head of *diseases of joints*, rather than those of *bones*. It follows, therefore, that the treatment of vertebral disease must be conducted on similar principles to those guiding us in the treatment of affections of the joints.

Now, the grand principles to be followed in the treatment of all arthritic affections are: to separate as far as possible the diseased surfaces, and to preserve them at perfect rest in their separated position. These principles must also guide us in the treatment of this class of diseases of the spine, if we would attain any satisfactory results.

It is obvious, therefore, that only that kind of apparatus will be beneficial, which by its construction will enable us to throw the superincumbent weight of the body from the bodies of the vertebrae upon the oblique articular processes, and thereby separate the diseased portions, which by their contact are continually irritating each other, and increasing the deformity by producing absorption. By this replacement we not only restore the patient to his former figure, but by the removal of all irritation, we at the same time stop the diseased action.

Dr. Davis says: "When the weight of the superincumbent portion of the body is thrown upon the healthy oblique processes of the spine, we have a natural articular support, and the diseased vertebral bodies are separated from each other. This separation relieves the patient from all *suffering*, according to the law discovered, and made known to the profession, by us, viz: that the pain and irritation, arising from ulcerated joints, was owing principally to pressure upon the diseased surfaces, said pressure being produced by the contraction of muscles passing over said joint."

"When these diseased surfaces are separated, there is no pressure or friction to prevent their healing, whereas before, the pressure interrupted nutrition, as strangulation from any other cause, while every motion of the parts upon each other brought the cancellated structure together like two millstones, grinding and destroying each other. The avoiding of this result is the reason why a patient can withstand this disease, and recover in a shorter time than when not subjected to this mode of treatment."

The many kinds of apparatus in general use to effect this purpose, that of substituting the oblique articular processes for the vertebral bodies, to support the head and trunk, do so by means of *counter-pressure alone*, thereby making them

sustain a weight much greater than that which nature intended them to bear. Now, while it is true that they are of firmer texture than the bodies, it is also certain that this unnatural weight will in time be the cause of their disintegration. In addition to this, their surfaces being so oblique, a greater part of the weight must fall upon their ligaments, causing their relaxation, and thus permitting the processes to slip by one another, distorting the articulation, and diminishing the height of the patient.

These evils can only be removed by employing two forces in lieu of one, viz: *counter-extension*, or *suspension*, and *counter-pressure* at a point at right angles with the spinal axis.

Dr. Benjamin Lee, of Philadelphia, was the first to call the attention of the profession to successes in this direction by the employment of suspension. He devised, partly in imitation of Prof. Mitchell, of Philadelphia, and partly acting upon a hint contained in a little German work by Dr. Nitzsche, a spinal swing, somewhat similar to Fig. 12, by which the patient was suspended from the floor, making the entire weight of the body below the diseased portion of the spine, the extending force.

The advantages of the mechanical treatment in these affections, by combining instruments for extension and pressure, over that consisting of

confinement in the horizontal posture, and the establishment of exhausting, painful and loathsome discharges, are incalculable.

Of course, the constitutional treatment will depend upon the systemic peculiarities of each case. Based upon a strumous or tuberculous diathesis, in connection with the constitutional and mechanical treatment, every therapeutical and hygienic measure should be adopted, that will invigorate the general health and improve the system.

The old principle of imprisoned rest in the prone or supine position for any length of time cannot be too severely reprobated. I have witnessed not a few cases where this treatment has been carried out, that have resulted in a gradual extinction of the vital forces, an increase of the local disease, and a final breaking down of the whole system. The only rest required for such cases is, a *rest of the part affected*, which may be procured by proper mechanical appliances, while healthful exercise, pure air, hygienic and therapeutic measures, will help to restore the shattered organism, and assist the mechanical treatment in overcoming the disease.

The appliances should be made as light as is compatible with strength, and should fit closely and firmly to the body to insure support and steadiness; they should be so adjusted as to make

pressure always in a direction opposite to the arc of the spinal column, and in an *upward* direction, for the purpose of taking off the superincumbent weight from the diseased vertebrae; also, to apply pressure on *either side of the spinal processes* so as to relieve pain, and prevent ulceration or excoriation of the external tissues. I am decidedly opposed to all those mechanical appliances, which constrain the little patient, on the score of *rest*, from taking a sufficient supply of that active exercise, and breathing pure air, which is so highly conducive to a healthy organism.

In the *very early period* of the disease, well regulated rest in the supine position may be beneficial, but the fact is, that these patients rarely fall into the hands of the surgeon until the period has passed, when general rest can be made of essential importance.

As measures of hygiene, those exercises, free and unrestrained, in which the heart and muscles act in unison, are of great value; and, in the early stages of this disease, the proper employment of all those agents, which most effectually develop and equalize muscular force, may often accomplish a complete and rapid cure. Calisthenics, gymnastics, etc. are of value, but most beneficial are those free active agents or agreeable exercises, which may be obtained by tumbling, rolling and rollicking in the open air.'



Good wholesome food, faradization, frictions, cold water and salt water bathings, are all important accessories, but, besides these, the general health demands attention, and by constitutional remedies, change of air, and the diligent and systematic employment of those measures conducive to the improvement of the digestive and assimilative system, great benefit may be derived.

In this class of diseases, a proper and scientifically conducted course of homœopathic treatment illimitably excels the *tonic* and *counter-irritant* system of the allopathic school.

The practice of applying *blisters*, *setons*, or *issues*, the application of leeches etc., remedial agents of the first rank in the allopathic school, for the treatment of these diseases, do serious and irreparable harm by their irritating and exhausting effects, and especially so from their long continued use.

The recourse to these agents for the purpose of keeping up a protracted counter-irritation, and discharge, is positively injurious! And, the establishing of a suppurative process to make an already distressingly emaciated child more so, or the use of such remedies, which produce pain, on one who is suffering agony already from the pain attending the disease, is a practice which cannot be too severely reprobated.

While, by the Homœopathic method of treatment the system is sustained and assisted in its efforts to overcome the morbid process, that is slowly undermining the constitution, in the old school, those agents are seized upon, which render the vital energies weaker and weaker, until exhausted nature is no longer able to bear up against the shock imposed upon her, and death ensues as a consequence of over-taxation of the already weakened organism.

For the purpose of relieving the vertebral bodies of the weight of the head and shoulders, a variety of mechanical appliances or braces have been devised, some showing great ingenuity and mechanical genius in their construction.

They are all made to conform to the same general principles, their object being to transfer the weight of the column from the bodies of the vertebrae to the oblique processes, these having a denser structure, and more able to bear pressure without injury (erosion).

The great majority of these appliances are constructed, with the idea of accomplishing this result, by padded crutches under the armpits. It is impossible by this means, to restore the spinal deformity to its proper contour, as the scapulae possess such mobility, that the shoulders are lifted upwards without removing the pressure from

the diseased spine, the result being an elongation of the muscles between the trunk and the scapulae, with a relaxation of the muscular structure of the neck and upper portion of the spinal column, without giving real relief to the patient.

The fact that these deformities are never seen among that class of persons who carry weights on their heads, or who indulge in a full development of their muscles, leads me to recommend the general employment of well directed physical training in our colleges, schools and seminaries of learning, and especially is it advised in our female academies. The propensity, so deeply interwoven among our people, for rapidly acquiring whatever of culture they are to have before taking their position in the social scale, is fraught with the most disastrous results to physical vigor and receptivity. "*Sana mens in sano corpore*" is an axiom as valuable to day as in the past, and if we are to have a race of more robust men and women than we now possess, physical education of the youth of both sexes must not be neglected during their mental training.

**PLASTER OF PARIS JACKET.** The proper application of the "plaster jacket" is one of the nicest and most artistic processes of mechanical surgery, and when I state, that my success in the use of this grand and recreative appliance was

not productive of the wished for results until I had "put up" at least half a dozen of these deformed little ones, I am only attesting to the great care and responsibility that attaches to the surgeon in the proper application of this most excellent and useful appliance of modern surgery.

Previous to the employment of the jacket, the surgeon should apply a flexible leaden strip to the entire length of the spine, adjusting it so nicely, that it shall receive the impress of all the prominences and sinuosities of the spinal column.

By then placing this strip upon paper, the correct and perfect shape of the deformity can be ascertained, it only being necessary to trace the outline of the leaden strip, carefully marking all its irregularities, in order to accurately illustrate the spinal distortion.

Preparatory also, to the application of the plaster jacket, for the purpose of exercising the muscles of the back, and to assist in the restitution of the deformed spine, I have been in the habit of putting these patients *daily* in the suspensory apparatus (Fig. 12) for the period of one or two weeks, according to the condition of the patient, and size of deformity.

During this period of suspension, the leaden strip may be used from time to time to show the

*Fig. 1.*



*Fig. 2.*





Fig. 4.



Fig. 3.



U of M

1700





(Fig. 12.)

improvement that has taken place in the curvature.

The method of applying my plaster jacket, although resembling that of Dr. Sayre on general principles, yet it differs considerably from that practiced by this eminent surgeon, as I have suggested a number of improvements both in the application of the jacket, and the construction of his "jury mast," which

have greatly assisted me in the treatment of these patients, materially decreasing the length of time required for a perfect cure.

A closely fitting woollen shirt, either woven or knit, *without seams*, is put upon the patient, pulled down tightly over the hips, and *held* there in order to prevent its wrinkling, and the consequent irritation of the skin.

The patient is then put in the suspensory apparatus, and while in a *state of extension*, the roller bandages, consisting of loosely woven cloth

(cross-barred muslin is the most appropriate), having been previously saturated, and its meshes completely filled, with plaster of Paris, Dextrine, starch, or any other substance which will retain its form, and become firmer and stronger, after solidification, are then carried around the *crests of the ilia*, closely adapting the roller to the contour of this portion of the body, as many times as is necessary to complete a strong and immovable support for the upper dressings.

This I have denominated my *artificial sacrum*, and upon this my apparatus or artificial spine rests; for, as the natural sacrum is the foundation of the normal spine, so the artificial sacrum gives firm support to the artificial spine.

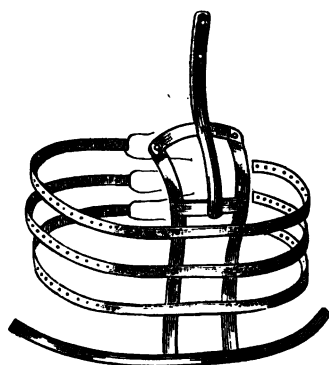


(Fig. 13.)

After allowing this to become partially hard and dry, a roller is to be carried around the body, encircling the entire trunk, from the crests of the ilia to the axillae, making a solid parietal structure (Fig. 13), upon which a series of roughened perforated tin strips are laid.

These strips should rest upon the artificial sacrum, and extend around the parieties of the ab-

domen and thorax, being placed about three or four inches apart. Another roller is then carefully carried upwards and downwards, interlacing and covering these artificial ribs, which form an additional support, and allows a more firm adjustment of the bandages, until the body is completely and strongly encased; the patient all this time being held in the suspensory apparatus, until the dressings are *set*, when he should be placed upon an air bed, taking the supine position, till the encasement becomes thoroughly and completely dry.



(Fig. 14.)

**THE ARTIFICIAL SPINE**, (Fig. 14), my improvement of Sayre's "Jury mast", as employed at present, consists of two pieces of malleable iron, three-fourths of an inch in width, and long enough to extend from the artificial sacrum to a

point above the distorted portion of the spine.

The lower extremities of these two pieces of iron are bent at right angles to the perpendicular bars, or another rod is attached (as is seen in Fig. 14), which is molded over the sacral plane

foundation, extending upwards and forwards to be closely adapted to the crests of the ilia on either side. To this flat foundation bar is fixed other tin roughened strips, long enough to extend from the upper part of the chest down to the bar, and bending under it, are turned upwards upon the back to lie snugly against the previously dried jacket. This is to give firm support, in connection with the fenestrated ribs, to the artificial spine, from which is to be suspended the superincumbent weight of the body, while the diseased spine is at rest and undergoing the process of elongation and repair.

The upright pieces, connected together at their upper extremities by two horizontal cross-bars, are about three inches apart, lie on either side of the jacketed spine, and are so tempered that they may be closely fitted to the contour of the external dressings. Three roughened perforated tin strips, about an inch wide, and of sufficient length to encompass the trunk, are rivited to this frame-work, to answer the purpose of artificial ribs.

This, when laid upon the foundation jacket, corresponding as it does with the natural spine and ribs, is to be firmly and evenly covered up by frequent turns of the plastered roller, carried upwards and downwards, until it is strongly and securely held in position.

From the upper circular portion of this iron framework, a steel bar extends upwards, having two screws at its extremity placed one and a half inches apart, to which is fastened, by means of two corresponding slots, about one inch in length, a second bar, that curves over the head to the upper part and center of the vertex. (Fig. 15.) By



(Fig. 15.)

this arrangement of the two bars, they can be lengthened or shortened at will, and after rightly adjusting the moveable bar, and then securing it by screws, we have a firm and strong support, extending from the artificial sacrum, upwards above the vertex, from which the head and shoulders can be suspended.

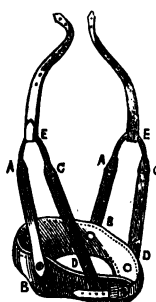
To the second bar is attached a small cross-piece, playing upon a pivot, to which occipito-mental straps are fastened for suspending the head. (Fig. 15.)

This may be effected also by means of plaster-strips attached to the upper portion of the thorax, and carried *over* the shoulders and down the back, and of sufficient length to form a loop to fasten to the upper portion of the second bar.

When all are carefully and securely applied, the occipito-mental straps (Fig. 16) are attached to the circular cross-bar, care being taken that the

pressure upon the chin be not so great as to create abrasions upon the tender cuticle of children. To prevent this, I would recommend that the parts subject to pressure be washed daily with a mixture of Arnica tincture and water, of the proportion of one part of the former to four of the latter. A daily application of this solution will prevent the tendency to abrasion of the sensitive cuticle in children so as not to interfere with the constant and continued use of the apparatus.

In order to keep up a more continuous and gradual extension, I have substituted an elastic band, or rather, introduced an elastic mento-occipital apparatus, in lieu of the unyielding leather straps of Prof. Sayre, the elasticity being proportioned to the age and size of the child,



(Fig. 16.)

and is intended to imitate, as nearly as possible, the springiness of the intervertebral cartilages in the natural state. This is shown in Fig. 16, the elastic bands, A-B-C-D, being terminated with leather straps, rounded in the center, so as to pass through a groove or ring in the attachment E, to the bar above the head.

**CONSTITUTIONAL TREATMENT.** Internal treatment should be especially directed towards the patients general health, with a view of removing,

if possible, the constitutional dyscrasia that exists, and upon which the local disease often depends. Thus, if the pathological condition depends upon a strumous, mercurial or syphilitic taint, the duty of the surgeon is to rectify, if possible, the constitutional cachexy by those remedies which are specifically adapted to one or the other of these disordered conditions.

If the disease depends upon scrofula, this being a consequence of mal-nutrition, those remedies which, acting upon the processes of digestion and assimilation, improve their tone and vigor, are the most appropriate. If, however, it is dependent upon syphilitic poison, those measures are to be employed, that will materially assist in completely eradicating the poison from the system.

If the patient be a female, attention must be given to the condition of the uterine functions, and any irregularity be promptly corrected.

It will be impossible, and indeed impracticable, in a work of this character to give all the indications of remedies to be employed throughout the treatment of this affection, and the various complications that follow in its train. The appropriateness of the remedies to be employed will be shown by a careful and systematic study of the *Materia Medica*.

The following are the remedies recommended: *Asafoetida*, *aurum*, *bell.*, *calc. carb.*, *carbol. ac.*, *lachesis*, *lycopod.*, *merc.*, *mezer.*, *nat. mur.*, *nit. ac.*, *phos.*, *puls.*, *rhus.*, *silicia*, *staph.*, *sulph.*

**Asafoetida.** Caries in scrofulous subjects; after the abuse of mercury; ulcers, with edges highly inflamed, accompanied by great sensitiveness; pus very thin, profuse, and very offensive.

**Belledonna.** Severe cramps in the small of the back; lancinations, from without inwards, in the vertebrae, resembling stabs with a knife; fainting fits; furious delirium, with dilated pupils; labored breathing. Patient is worse in the afternoon, evening, or at night.

**Calc. carb.** Stinging and cutting pains; can scarcely rise from his seat after having been seated; sickness at stomach, and great weakness. Easily tired by bodily exertions; talking makes him weak; emaciation more or less apparent. Worse in the morning; also in the open air, and in wet weather.

**Lachesis.** Luxative pain in small of back, as from too great exertion, with awkward, tottering gait, and jerks, taking away the breath.

**Lycopodium.** Sudden failing of strength; great thinness; feeling in small of back as if flesh were



loose ; chilliness in back ; stiffness, pinching, rheumatic tension, or drawing pains in the back ; burning between scapulae as if from a red-hot coal.

**Mercurius.** Griping pains in small of back ; bruised pains in whole of back ; sinking, with an indescribable malaise of body and mind ; paroxysms of spasmodic contractions in the limbs ; copious perspiration at night, from which no relief is obtained. Worse on getting warm in bed.

**Mezereum.** Mercurial poisonings ; rheumatic pains between shoulder blades, preventing motion ; limbs feel as if shortened. Worse from touch or motion ; relieved in open air.

**Natrum Mur.** Especially suitable in caries of the spine before suppuration has set in.

**Nitric Acid.** Especially suitable for lean persons, with dark complexion, black hair and eyes (exactly opposite to Calc.). Syphilitic cachexia ; mercurial poisonings.

**Phosphorus.** Pain as if back was broken ; paralytic weakness of the small of back ; sick and paralytic feeling of the body. Spinous processes of the vertebrae, between the shoulder blades, are very sensitive to touch, also the muscles between the spinal column and left shoulder blade.

**Pulsatilla.** Aching pains, as if weary : lacerating or sticking pain in back ; excessive debility ;

tremulous weakness; gloomy and melancholy; peevishness; interscapular pain, worse by inspiration.

**Rhus Tox.** Numbness and stiffness of the limbs; gait slow, dragging, difficult; sudden paroxysms of fainting; tightness of breath, and contractive sensation in the chest; worse on beginning to move, better from continued motion. Curvature of dorsal vertebrae.

**Silicia.** Lameness of the back, with pressure and tension, especially on touching it; violent, spasmodic pains; inflamed psoas abscess; sinuses from abscess; severe bone-pains; heaviness of the lower limbs.

**Staphisagria.** Stitches, as with knives, between the cervical vertebrae. Weakness of the muscles of the neck, with heaviness of the head, which falls forwards while sitting, or has to be leaned against something backwards or sideways; soreness and drawing pressure in the upper vertebrae, also severe stitches in the same, upwards. Suppurating swelling in the psoas muscles.

**Sulphur.** Nightly suffocative fits; taciturn, out of humor; irritable; talking excites pain; burning, drawing and pulsating pains in back; creaking and cracking of the vertebrae, especially on bending the head back, and pressing it on the pillow.

**CASES.** The three following cases of antero-posterior curvature, as represented by the following illustrations, are selected to show the great deformity that takes place in this disease, and at the same time, to demonstrate the splendid achievements that follow my improved method of treatment.

These, so far, have been the most exquisitely crooked and ill-shapen patients that have fallen to my lot, upon whom to employ this new process of cure; and I feel a just pride in testifying to the incomparable efficacy of *this* over all known methods of restitution in spinal curvatures, of whatever nature or degree.

It was in one of these cases, that I was compelled to study out a substitute for Prof. Sayre's method of support and retention, which held the parts in situ for a short time, but they soon returned to their original misshapen contour. It occurred to me, that if I could make the sacral plane more firm and unyielding, the *rotation* would be prevented. I, therefore, conceived the idea of attaching the *flat flexible bar* to the upright columns, which should be adapted closely to the foundation structure, and, passing upward and forward, hug closely the crests of the ilia, to form a fundamental sacral base.

Over this were bent the corrugated tin strips, which, with the fenestrated ribs, held in situ by the plaster-roller, made a fixed and firm support in antero-posterior curvature, and an immovable barrier, against which the contracted muscles, in lateral curvature, pulled in vain.

**CASE 20.** *Ellen F*—, ten years of age. Cause of deformity not ascertained; supposed to result from a fall from a swing, about three and one half years ago. Two or three weeks after falling, she had a high fever, and about four or five months later, first perceived a deformity in the spine. Her symptoms then were, pains in side and back, very severe and continual.

*Has not been able to walk for two years, the first year, not at all, but during the last twelve months, could hobble about the room on crutches, moving from chair to chair.*

**PRESENT CONDITION.** June 27, 1877. Unable to walk, excepting with crutches, and then only about the room. Had to be carried to the office. Complains of severe pains in side and breast, difficult breathing, etc.

**EXAMINATION.** Pott's disease of the whole dorsal region. Hump on back extending about four inches posterior to plane of the spine.

**TREATMENT.** Suspensory apparatus daily. Internal treatment, calc. carb., phos., and bell.



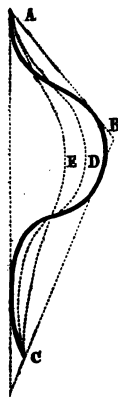
(Fig. 17)

July 12. Has used suspensory apparatus daily. Walks better, and is generally improved. Walked to the office, a distance of about three quarters of a mile, with the aid of crutches. Pains not so severe.

I applied, at this time, the plaster jacket, and my artificial spine.

July 20. Has had no pain since application of artificial spine, and plaster jacket. She feels "so well" and "breaths so much better", as she expressed herself. Appetite, from being almost entirely gone, is now good. Walked from her home to office without crutches.

Aug. 24. Re-applied "jacket and artificial spine" today. Leaden strip shows an improvement of an inch in antero-posterior diameter. Patient walks about the office without support of any kind. Feels perfectly well; has improved



(Fig. 18.)

A-B-C. shows the original contour of the spine. A-D-C, the improvement in one month's treatment. A-E-C, the present status of the deformity.

greatly in health and appearance, and is over an inch taller than when first examined.

Fig. 18 shows the improvement in the spinal deformity, it being about half its original contour and size. The patient attends school every day, and walks back and forth, nearly half a mile, playing and sporting with her companions on the way.

The spine in this case will become perfectly natural, and the patient completely restored within one year from first visit, if no unforeseen accident occurs.

**CASE 12.** *Mamie W.*, 11 years old. Had a fall in 1873. She cried lustily at the time, and said "her side (left) hurt her." This pain in the side grew worse instead of better, under the care of several physicians, who treated her for *neuralgia &c., &c.*

About two months later, the deformity commenced to develop itself.

Sometime after the accident, she had paralysis of the lower extremities, and until within the last year has been completely powerless to move them. She has always been a sickly child.

**PRESENT CONDITION.** Aug. 29th, 1877. Very much emaciated, with shrunken countenance and hollow eyes, presenting a sad picture indeed.

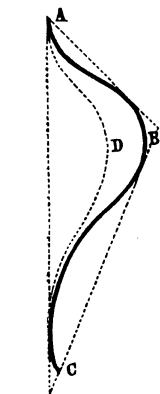
Walks with head thrown to one side, and one shoulder about two inches higher than the other. Complains of headache, and pain in left side, seldom leaving her room. Has no appetite. Bowels irregular, and frequently terribly constipated, she having no motion at times for about two weeks. "Has to take physic to effect a motion."

Cannot stand long, it increases her headache. Unable to walk longer than a few minutes at a time, because she gets "so tired", and one of her feet drags. Tottering gait. Shortness of breath.

**EXAMINATION OF SPINE.** Pott's disease of lower cervical and dorsal vertebrae, complicated with a lateral twist.

Diameter of angular curvature from line A-C (Fig. 19) over three and one half inches, the lateral twist carrying the encurved portion of the spine about two inches out of the perpendicular.

(Fig. 19.)  
A-B-C, outline of deformity on receiving the patient. A-D-C, contour after one month's treatment.



**TREATMENT.** Use of suspensory apparatus for a short time. Internally, calc. carb., sulph., lach. and phosph.

Sept. 7. General health improved. Breaths easier. Has had to take no physic; has had very little headache; can walk much farther; no dragging of feet. "Put up" patient in plaster jacket, and applied my artificial spine.

October 5. Re-applied plaster jacket to-day. Have seen patient several times since Sept. 7, each time, she expresses herself as being very comfortable, feeling much better; her head aches very seldom now, pain in side entirely gone, feeling much stronger. Her general appearance is greatly improved. Outline of deformity shows a decrease of about one inch in diameter in the angular curvature, while the lateral twist is only perceptible. (Fig. 19.)

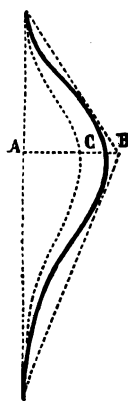
**CASE 43.** *Pott's disease.* *Dodie M—*, aged six years. Deformity resulting from a fall. Fell down stairs, three years ago. For four or five months following the accident, patient complained continually of severe backache, attended with headache, fever &c., for which she was treated, the physicians in attendance diagnosing the case, congestion of the kidneys.

The deformity was first noticed about one year subsequent to accident. Patient was then complaining considerably, being troubled with pains in the back; was always "so tired", and her side (right) hurt her on walking.



**PRESENT CONDITION.** Sept. 1st, 1877. Health tolerably good. Inability to walk any distance, and to breath easily, with pains, sometimes very severe, in the back and side (gastralgia), are her only complaints.

**EXAMINATION OF SPINE** showed Pott's disease of middle dorsal vertebrae. Abnormal curve or hump being about three inches in extent.



(Fig. 20.)

A-B, (3 inches) extent of deformity when first examined. A-C, (2 1/4 inches) extent of deformity after the daily use of suspensory apparatus for 13 days, and having been "put up" for 15 days, only 28 days of treatment in all.

**TREATMENT.** Daily use of the suspensory apparatus for about two weeks. Internally, calc. c<sup>30</sup>., one dose twice a day.

Sept. 13. Has been using the apparatus for suspension every day since first seen. Pains are not now so frequent or severe. Patient describes a feeling of great relief, while in suspension, saying "I can *breath* so much easier."

Applied the plaster jacket, but on account of the little patient having been "very cross and fretful" after her long suspension, I postponed putting on my artificial spine until next day.

Sept. 28. Re-applied plaster jacket to-day, the former application throwing the head too far

back, which can be accounted for by the unruliness of the patient during the adjustment of the former dressings. Before applying the jacket, an outline of the curvature was taken, which shows an improvement in the distortion of about three fourths of an inch in diameter. (Fig. 20.)

Oct. 12. Patient feeling perfectly comfortable. Has had very little pain since application of artificial spine.

The plaster jacket and artificial spine can be changed as often as may be desirable to accommodate itself to the increased development and rectification of the patient. With my own improvement applied, I have not found it necessary to remove the dressings oftener than once in two months, especially in cool weather. In warm weather, my plan is not to put on the *foundation* structure too thick, which renders it more comfortable to be worn, and can be removed and re-applied with less difficulty. In the majority of early deformity cases, and before the bones and ligaments have undergone much structural change, I have found no other apparatus to be required than the one I have described. I believe that every case of youthful spinal curvature can be completely and perfectly cured by the foregoing method. In cases of adults, however, in which the deformity has existed for a long time, and the

bones have become greatly changed in form and structure, the rectification of the deformity is an exceedingly slow process. In certain cases of lateral curvature, it is absolutely necessary, in addition to the methods given for its treatment under that subject, to divide the contracted muscles subcutaneously, and thus let loose the imprisoned side of the body. Without dividing or rupturing whatever muscles antagonize the curative action in such cases, it is simply impossible to straighten up a deformed spine. Prof. Sayre relates a case, wherein the muscular contracture was so great, during suspension, that it was impossible to straighten the patient until the fibres of the antagonistic muscle were divided. A reflex spasm of nearly all the muscles of the body was produced, by making pressure upon the contracted muscle with his finger. He, therefore, divided this muscle with a strong tenotome, and with a short, sawing motion, while with his thumb he pressed firmly upon the tightly drawn band. The fibres snapped as they were being divided, and the obstacle to restitution being removed, the spinal deformity was sensibly diminished. The pain attendant upon this operation is comparatively slight; the wound is dressed with adhesive plaster, a roller is firmly adjusted around the body, and the patient is made to feel quite comfortable. In only one case have I experienced this exceed-

ingly great muscular tension, which was finally overcome by diligent, gradual, and persistent efforts, the patient making a good recovery. I have under treatment at the present time five persons over nineteen years of age, three of whom are females with rotary-lateral curvature, and two are males with antero-posterior curvature, all of whom are being gradually restored to an improved condition of health and fair spinal rectitude.

While preparing these pages for the press, an exceedingly interesting case (No. 53.) presents itself, one that has been under treatment at the National Institute, Indianapolis, for one year, the patient and deformity gradually becoming worse.

When first seen, she could not stand without support, her spine being much distorted.

After one weeks treatment, consisting of suspension, twice a day, and internally, calc, c., she was enabled to walk across the room quite firmly.

She has been twice "put up" since, and shows a marked improvement in her deformity, is two inches taller in height, and her general health greatly benefitted.

I have added a table of a few of the more interesting and unique cases treated by this new process, a glimpse at which will be sufficient testimony to the efficacy of, and good results that follow, this improved method of cure.

# Selected Cases of Spinal Curvature, treated by E. C. FRANKLIN, M. D.

No.	NAME.	Age	Sex	Cause of deformity.	Family history, & previous condition of patient.	Condition & symptoms when first seen.	Location and extent of deformity.	Treatment.	Result, or Present Status.
5	Sarah K.	7	F.	From a fall three years ago.	Good. Child was strong and healthy before fall.	Greatly prostrated; suffers from pain almost continually; sleeplessness; walks with great difficulty; spine sensitive to touch.	Antero-posterior curvature. Cervical regions, about two and one half inches in extent.	Applied Plaster jacket and Artificial Spine once. Internally, Calc. Phos., Phos., & Lye.	Better in every respect. No pain. Walks well. Deformity much reduced.
12	Mamie W.	11	F.	From falling down one step, four years previous.	Father healthy. Mother delicate. Child always delicate.	Emaciated, countenance pinched and withered. Pains in head, back and side, which seldom leave her. Tottering gait; cannot walk far; it takes her breath away.	Antero-posterior curvature, with marked lateral twist. Greatly deformed, hump being over three inches.	Artificial spine, and "jacket," applied twice. Internally, Sulph., Calc. Carb., Lactesls.	Much better. Little pain. Child walks well as any child. Deformity reduced nearly one-third.
15	Katie G.	6	F.	Deformity first noticed after an attack of typhoid fever, 2 years ago.	Both parents healthy. Child healthy.	Fat, fine looking child. Has paralysis of left lower limb.	Antero-posterior curve, about one inch in extent. Lower dorsal region.	Artificial spine, and "jacket," applied twice. Is now wearing simply the "jacket."	Curve hardly noticeable. Paralysis much better.
20	Ellen F.	10	F.	Supposed to result from a fall from a swing.	Both parents unhealthy. Child delicate.	Unable to walk, excepting across the room, and then only with the aid of crutches. Severe pains in the back and chest. Difficult breathing.	Angular curve of whole dorsal region. Four inches in diameter.	Applied artificial spine and plaster jacket twice. Internally, Calc. Carb., Calc. Phos., Bell.	Feels perfectly well. Walk improved from the first. No pain. No support without the aid of mechanical support. Curvature shows an improvement of about two inches, or about one half its former size.
27	Katie S.	19	F.	Cause not ascertained. First noticed 9 years ago.	Father, not known. Mother delicate. Girl healthy.	Has little pain. Complaints of shortness of breath.	Lateral curvature. Primary curve in upper dorsal and lumber regions.	Plaster jacket twice.	Deformity not so marked. Breaths easier. Able to work better, and is "lighter, and free from pain."
32	John W.	8	M.	Cause unknown. Child is of scrofulous diathesis, which was probably the predisposing cause.	Father died of Consumption. Mother healthy. Child delicate.	Walks very little. "Gells tired so easily on walking". Pains in back and chest. Poor appetite. Difficult breathing. Sleeps very little, and is very restless at night.	Posterior curve of dorsal region, four inches in extent.	"Put up," twice. Internally, Calc. Carb., Sulph., Rhin. Tox.	Improvement marked. Deformity now but half original size. Breaths easier. Appetite good. Sleeps well.

# **Selected Cases of Spinal Curvature, treated by E. C. FRANKLIN, M. D.**

No.	NAME.	Age Sex	Cause of deformity.	Family history, & previous condition of patient.	Condition & symptoms when first seen.	Location and extent of deformity.	Treatment.	Result, or Present Status.
38	May R.	10 F.	Fall from carriage two years ago.	Both parents healthy. Child healthy.	Good condition. Suffers from pains in side and back. Breaths with difficulty. Weakness of muscles of the neck.	Antero-posterior curve, about two inches. Upper dorsal and cervical regions.	Applied "jacket" twice. Internally, Puls., Staph., Calc., Phos.	Deformity reduced one-half. Breaths "so much better". Better in every way.
43	Dodie M.	6 F.	Fell from a fall three years ago.	Parents healthy. Child healthy.	Is always "so fixed". Pain in chest and back.	Antero-posterior curve, about three inches.	"Put up" twice. Internally, Rhus tox., Calc. carb.	Deformity improved nearly one inch. Well otherwise.
46	Willie S.	10 M.	Fall from nurses arms, seven years ago.	Father healthy. Mother and child delicate.	Pains in back and chest, of a cutting character. Pains worse in morning. Difficult to breathe. "Cannot get his breath."	Antero-posterior curve, nearly five inches in extent. Dorsal and cervical regions.	"Put up" once Internally, Calc. Carb., Rhus tox., Phos., sulph.	Complete relief of all chest symptoms. Pains much better. Improvement in curvature marked.
50	Sadie McC.	13 F.	Supposed to result from a severe attack of rheumatism, no other cause can be assigned.	Father healthy. Mother healthy. Child apparently healthy.	Shortness of breath. Chilliness of back. Easily tired. Pains in back and side.	Angular curve, of lower cervical and upper dorsal regions. Extent two inches.	"Put up" twice Internally, Lycopodium, Lach., Calc. Carb.	Curvature reduced one-half. Rhus tox. All unpleasant symptoms disappeared.
17	Grace B.	9 F.	Fell down stairs.	Both parents healthy and of good size. Child healthy.	Pain in back. Great difficulty in walking and standing. Saw case second day after injury.	Angular curvature of upper dorsal region. Gradually increased until extension was applied.	Employed REST, hot applications, and Internally, Puls., Calc., Rhus, Socalc. and Nux. Vom. Suspension.	Result perfect recovery. No evidence of deformity.
25	Harry N.	7 M.	Was struck by a piece of falling timber.	Father died of phthisis. Mother healthy. Child apparently healthy.	Palpitation of heart on slight movement. Great pressure about thorax. Shortness of breath. Pains worse at night. Partial paralysis of left lower extremity.	Antero-posterior curvature. Dorsal region. Extent, 4 inches.	"Put up" twice. Internally, Phos., Calc., Phos., Rhus, Calc. Carb., Merc.	Great improvement. Deformity reduced over one-half. All symptoms have passed away.

No.	NAME.	Age	Sex	Cause of deformity.	Family history, & previous condition of patient.	Condition & symptoms when first seen.	Location and extent of deformity.	Treatment.	Result, or Present Status.
29	Mary S.	8	F.	Followed an attack of typhoid fever, three years ago.	Parents healthy. Child healthy, seemingly.	Partial paralysis of right leg and side. Pains in back, worse at night. Walks with great effort. Palpitation on least exercise. Child scrofulous.	Double lateral curvature. Began in lumber region. Compensating curve in dorsal region.	"Put up," once. Internally, Sulph. Calc. Phos., Merc.	Marked improvement. Pain in back disappeared. Palpitation better. Walks pretty well. Appetite good, gaining flesh.
33	Katie M.	6	F.	Came from an attack of measles 4½ years ago.	Both parents healthy, child apparently so before this attack of measles. Was at 'National Institute,' Indianapolis, for measles, a year; not benefited by treatment.	Looks very delicate, from long confinement in splints. Great pain in back. Partial paralysis of lower limbs. Walks with great difficulty. Has scolips valgus, and a slight equinus of left foot. Shakes of head. Provoked by little exercise.	Antero-posterior curvature of middle dorsal region. Deformity over three inches in diameter.	Suspended twice a day for one week. "Put up," once. Internally, Calc. Phos.	Improvement considerable. Walks better, and is much stronger. Talipes improved. General health better.
39	May B.	10	F.	Supposed to result from a fall from a buggy, three years ago.	Both parents healthy. Child healthy before accident.	Cramps in stomach. Pains in back and chest. Headache. Indigestion. Appetite poor. Eyes weak. Walks with difficulty, and with her hands on her knees for support. Has had three fistulous opening in lower dorsal region. Back very sensitive to touch.	Antero-posterior curvatures of dorsal region. Extent over two inches.	Suspended once a day for one week. "Put up," once. Sulfica. Calc. Phos., internally.	Improvement marked. Walks better and with out support. General health improved.
57	Mary C.	21	F.	Cause unknown, was discovered by dressmaker.	Parents healthy. Patient healthy.	Complains but little of unpleasant symptoms. Short of breath after least exercise. Walks slightly sideways. Has felt herself getting gradually worse. Substituted pads to conceal deformity.	Double lateral curvature. Primary curve in upper dorsal, compensary in lumber region.	"Jacket" applied once. Internally, Nux., Secale, Phos.	Improvement 'slight. Can walk with more strength. Feels 'not so bound up,' as before.

# INDEX.

	PAGE.
Anatomy of the Spine.....	10
Antero-Posterior Curvature.....	35
etiology of.....	35
symptoms of.....	39
treatment of.....	48
Artificial Sacrum.....	58
Artificial Spine.....	59
Arthro-chondritis.....	37
Cases .....	67
Tabulated.....	77
Constitutional Treatment.....	62
Corset for Lateral Curvature.....	32
Definition of Spinal Deformity.....	5
Examination of Spine.....	43
Etiology of Lat. Curvature.....	15
Hygiene in Spinal curvatures.....	52
Lateral Curvature.....	15
etiology of.....	15
pathology of.....	22
symptoms of.....	27
treatment of.....	28
Mechanical appliances .....	30-54
Occipito-mental apparatus.....	62
Paralysis, complete and partial.....	46
Plaster of Paris Jacket.....	55
Selected Cases.....	77
Spinal Abscess.....	37
Spine, anatomy of.....	10
examination of.....	43
Suspensory Apparatus.....	57
Treatment, Constitutional.....	62
mechanical.....	30-50